

Amplifier Selection Guides

These charts are intended as selection guides only. For complete and precise specifications, consult the data sheet for each model.

Applications Guide for Timing Amplifiers

Detector Application	Amplifier Model Number Ranked in Order of Desirability (1 = optimum solution)									Alternate Methods	
	FTA820A	VT120	9301	9305	9306	9302	474	579	863	Feed Detector Output Directly to Timing Discriminator	Use Timing SCA with Spectroscopy Amplifier Output
Single Photon Counting		2	3	2	2	1			3		
Single Photon Timing		1	2		1						
Microchannel Plates, Microchannel Plate PMTs, and Channeltrons		2			1						
Fast Plastic or Liquid Scintillators	2	2	4	4	4					1	5
Nal(Tl) and Slow Scintillators	4	4		2	5				3	1	4
Proportional Counters								3	2	3	1
Si Charged-Particle Detectors	1	1	2	2	4			4	3	4	5
Si(Li) Detectors								2	1	2	3
Ge Planar & LO-AX Detectors								2	1	3	
Ge Coaxial Detectors (GEM, GAMMA-X)								2	1	3	

Selection Guide for Timing Filter Amplifiers*

Model	Number of Channels	Output Minimum Rise Time	Shaping Time Constants		Gain (for each channel)	Baseline Restorer	Output Range	Comments (Package width)
			Integration	Differentiation				
474 Timing Filter Amplifier	1	≤10 ns	Out, 20, 50, 100, 200, and 500 ns	Out, 20, 50, 100, 200, and 500 ns	±2 to ±250	time-invariant	0 to ±5 V	(1-wide NIM)
579 Fast-Filter Amplifier	1	<5 ns	Out, 10, 20, 50, 100, 200, and 500 ns	Out, 10, 20, 50, 100, 200, and 500 ns; also 50-Ω cable clip.	±0.9 to ±500	gated	0 to ±f V	(1-wide NIM)
863 Quad Timing Filter Amplifier	4	<10 ns	Out, 50 ns, and optional	Out, 200 ns, and optional; also 50-Ω cable clip.	±2 to ±250	time-invariant	0 to ±5 V	Requires ±6 V power (1-wide NIM)

*For all models:

- 100-Ω input impedance to match 93-Ω cable from preamplifier. For 50-Ω cables add a tee and 100-Ω terminator to the input.
- Outputs drive a 50-Ω load.
- Differentiator includes adjustable PZ cancellation.

Amplifier Selection Guides

Selection Guide for Wideband Timing Amplifiers*

Model	Number of Channels	Output Rise Time	Output Range	ac/dc Coupling	GAIN (for each channel)	rms Equivalent Input Noise	Comments (Package Width)
FTA820A Fast Timing Amplifier	8	≤1 ns	0 to -5 V	ac	A: +200	<20 μV	(1-wide NIM)
VT120 Fast Timing Preamplifier	1	≤1 ns	0 to -5 V	ac	A: +200 B: -200 C: +20	<20 μV	(Preamp)
9301 Fast Preamplifier	1	<1.5 ns	0 to ±0.7 V	ac	+10	<25 μV	(Preamp)
9302 Amplifier and Discriminator	1	3 ns	0 to -500 mV	ac	+20 or +200	≤10 μV	Amplifier Z _{OUT} = 50 Ω. Incorporates fast discriminator and rate monitor. (1-wide NIM)
9305 Fast Preamplifier	1	<3 ns	0 to ±5 V	dc	+5 to +10	<30 μV	Excellent gain and dc stability. Adjustable gain. (Preamp)
9306 1-GHz Preamplifier	1	0.35 ns	0 to -2 V	ac	100	<100 μV	Optimized for micro-channel plates and microchannel-plate PMTs. (Preamp)
9326 Fast Preamplifier	1	<1 ns	0 to -1 V	ac	5,10, or 20	<100 μV	10-kHz low-frequency roll-off, optimized for use with FASTFLIGHT™

*For all models:

- 50-Ω input impedance.
- Outputs drive a 50-Ω load.

Amplifier Selection Guides

Amplifiers for Pulse-Height or Energy Spectroscopy

Applications Guide Ranked in order of desirability (1 = optimum solution)

Detector Application	Amplifier Model Number								
	460	570	572A	575A	590A	671*	672*	673*	855
PMTs, Microchannel Plates, Microchannel Plate PMTs, Channeltrons	1	2	3	1	1	3	3		1
Scintillation Detectors	1	2	3	1	1	3	3		1
Proportional Counters	4	2	3	1	1	3	3		1
Si Charged-Particle Detectors		2	3	2	4	3	3		2
Si(Li) Detectors		4	3			2	1		
Ge Planar and LO-AX Detectors									
Up to 3000 counts/s		2	3			4	4		
Up to 100,000 counts/s			3			2	1	3	
Up to 300,000 counts/s						2	1		
Ge Coaxial Detectors (GEM, GAMMA-X)									
Up to 3000 counts/s		1	1			1	1	2	
Up to 30,000 counts/s			3			2	1	3	
Up to 100,000 counts/s								1	

*The models 671, 672, and 673 are required when using a reset type preamplifier (-PLUS, TRP, and POF).

Selection Guide for Delay and Summing Amplifiers

Model	Features	Package Width
427A Delay Amplifier	Variable delay of linear signals from 0 to 4.75 μ s in 0.25- μ s steps. Used to align arrival times of linear and logic signals.	1-wide NIM
533 Dual Sum and Invert Amplifier	Provides summing of signals for up to 4 inputs. Inverting or non-inverting.	1-wide NIM

Amplifier Selection Guides

Selection Guide for Linear Pulse-Shaping Amplifiers

Model	Differential Input	Gain	Pulse Shaping	Shaping Time Constants	Baseline Restorer	Pile-Up Rejector	PZ Adjust	Comments (Package Width)
460 Delay Line Amplifier	No	±3 to ±1000	Single and double delay-line shaping (unipolar and bipolar)	1- μ s delay-line clip. Separate 0.04, 0.01, and 0.25 μ s RC integration	Time-invariant	No	Manual	Selectable 1- μ s unipolar output delay (1-wide NIM)
570 Amplifier	No	±1 to ±1500	Semi-Gaussian unipolar	0.5, 1, 2, 3, 6, and 10 μ s	Gated; auto or manual noise discriminator	No	Manual	(1-wide NIM)
572A Amplifier	No	±1 to ±1500	Semi-Gaussian unipolar; bipolar	0.5, 1, 2, 3, 6, and 10 μ s	Gated; auto or manual noise discriminator	PUR noise discriminator level set by BLR noise discriminator	Manual	(1-wide NIM)
575A Amplifier	No	±5 to ±1250	Semi-Gaussian unipolar; bipolar	0.5, 1.5 and 3 μ s (PWB switches)	Gated, with auto noise discriminator	No	Manual	(1-wide NIM)
590A Amplifier and Timing Single-Channel Analyzer	No	±5 to ±1250	Semi-Gaussian unipolar; bipolar	0.5, 1.5, and 3 μ s (PWB switches)	Gated, with auto noise discriminator	No	Manual	Incorporates timing SCA (1-wide NIM)
671* Spectroscopy Amplifier	Yes	±2.5 to ±1500	Semi-Gaussian and quasi-triangular unipolar; bipolar	0.5, 1, 2, 3, 6, and 10 μ s	Gated, with auto noise discriminator. Auto or high BLR rate.	PUR with separate auto noise discriminator and % rejection LED	Manual	Auto overload protection for pulsed-reset preamplifiers (1-wide NIM)
672* Spectroscopy Amplifier	Yes	±2.5 to ±1500	Semi-Gaussian and quasi-triangular unipolar; bipolar	0.5, 1, 2, 3, 6, and 10 μ s	Gated, with auto noise discriminator. Auto or high BLR rate.	PUR with separate auto noise discriminator and % rejection LED	Auto** or manual	Auto overload protection for pulsed-reset preamplifiers (2-wide NIM)
673* Spectroscopy Amplifier and Gated Integrator	No	±1 to ±1500	Gated-integrator and semi-gaussian unipolar	0.25, 0.5, 1, 2, 3, and 6 μ s semi-Gaussian prefilter	Gated; auto or manual noise discriminator	PUR noise discriminator level set by BLR noise discriminator	Coarse and fine; manual	Combines semi-Gaussian and Gated-integrator amplifiers in one module (2-wide NIM)
855 Dual Amplifier	No	±5 to ±1250	Semi-Gaussian unipolar, bipolar	0.5, 1.5, and 3 μ s (PWB jumpers)	Gated with auto noise discriminator	No	Manual	Two Model 575A Amplifiers in a single module (1-wide NIM)

For all models:

- Input impedances in the range from 465 to 2000 Ω .
- Linear outputs drive 0 to +10 V (unipolar), 0 to +10 V (bipolar) on a 93- Ω load.

*The models 671, 672, and 673 are required when using a reset type preamplifier (-PLUS, TRP, and POF).

**U.S. Patent No. 4,866,400

Specifications subject to change
082609