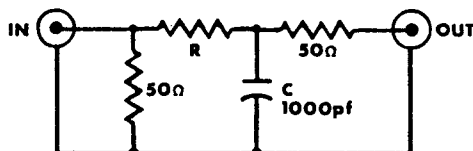


PRODYN PASSIVE INTEGRATORS
MODELS PI-1, 5, 10 & 100

The PI-1, 5, 10, and 100 series Integrators are passive resistor-capacitor integrators with standard RC time constants of 1, 5, 10 or 100 microseconds. They are available with standard connector types such as "N" (shown) or other styles can be specified. The unit and its idealized circuit (which is based on the AFWL RCI-1B integrator) is shown below:



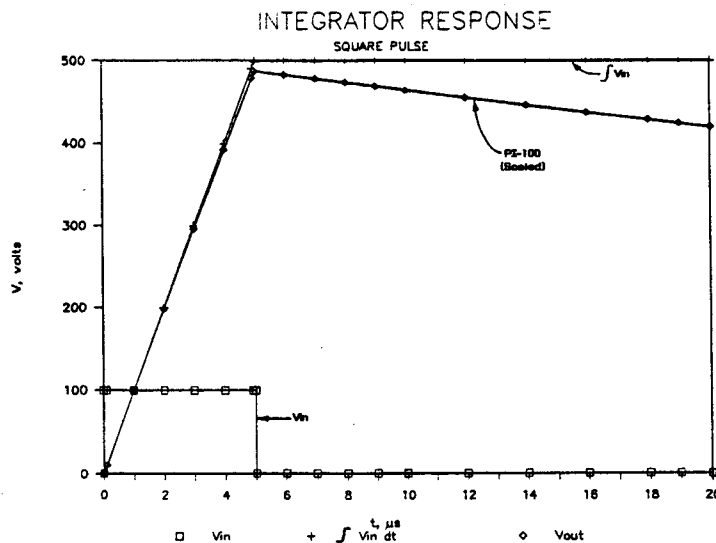
The transfer function of the Integrator is implicit in the Differential equation:

$$R \frac{dq}{dt} + \frac{q}{C} = V_{in}(t)$$

where q is the charge on the capacitor. The integrator is designed to drive a >1 megohm, <10 pf load impedance. The voltage out is essentially the voltage across the capacitor, q/C, which is calculated by solving (integrating) the differential equation for q(t). This is most conveniently done by Laplace transforms, which yield the transfer function in the frequency domain:

$$\frac{V_{out}(s)}{V_{in}(s)} = \frac{1}{sRC + 1}$$

where s = jω = Laplace operator. The transfer function is an integrator for sinusoidal inputs with frequencies large compared and $\frac{1}{2}\pi RC$ to transient inputs for times small compared to RC. Typical performance of the PI-100 integrating a 5μ square pulse is shown at the right. This pulse is integrated with an error of 2.5% over the 5μs duration.



SPECIFICATIONS

	<u>PI-1</u>	<u>PI-5</u>	<u>PI-10</u>	<u>PI-100</u>
Input Impedance			50 ohms	
Load Impedance			>1 megohm, <10 pf	
Maximum Vin			Dependent on Connector Type	
Maximum CW Pin			1 watt	
RC (Time Constant)	1μs	5μs	10μs	100μs
CW Accuracy (5%)	100 MHz	75 MHz	75 MHz	20 MHz
CW Accuracy (3 db)	200 MHz	150 MHz	150 MHz	40 MHz
Connectors	SMA, TNC, BNC, N, GR (others on Special Order)			
Size	1.00 (2.5 CM) x 1.00 (2.5 CM) x 2.0 (5.0 CM) Body Length Only			
Mass	4 Oz (100 g)			