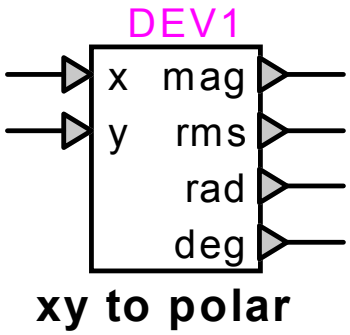
Phasor operation : x,y to polar detailed



1 Description

This device converts an (x,y) representation of a vector or phasor to its polar (magnitude,angle) equivalent.

1.1 Pins

This device has six pins:

pin	*type*	*description*	*units*
x	input pin	x-coordinate	any
y	input pin	y-coordinate	same as x
mag	output pin	magnitude (peak)	same as x
rms	output pin	magnitude (rms)	same as x
rad	output pin	angle (radians)	rad
deg	output pin	angle (degrees)	deg

1.2 Parameters

No parameters are required for this device.

1.3 Input

The input pins may be connected to any control signals.

The (x,y) coordinates are the *x*-axis and *y*-axis projections of a vector or phasor on a reference frame.

1.4 Output

The output is the polar representation of a vector or phasor in a reference frame. The polar coordinates are the magnitude and angle corresponding to the (x,y) coordinates used as input.

The conversion from (x,y) to polar is immediate, and is calculated as follows:

$$\begin{aligned} \text{magnitude} &= \sqrt{x^2 + y^2} \\ \text{angle} &= \tan^{-1}\left(\frac{y}{x}\right) \end{aligned} \qquad (1)$$

The phasor magnitude is available as the peak amplitude and its no-harmonic RMS equivalent (magnitude divided by $\sqrt{2}$). The phasor angle is available in radians and in degrees.