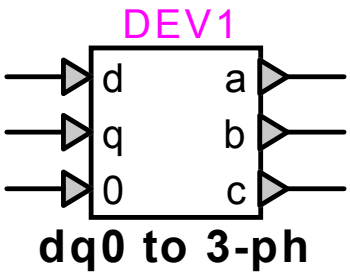
Meter : dq0 to 3-phase



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1 Description

This device converts the instantaneous value of a dq0 equivalent to the corresponding 3 phase signals in the stationary reference frame.

1.1 Pins

This meter has six pins:

pin	*type*	*description*	*units*
d	input pin	d-component	any
q	input pin	q-component	same as d
0	input pin	0-component	same as d
a	output pin	phase-a	same as d
b	output pin	phase-b	same as d
c	output pin	phase-c	same as d

1.2 Parameters

The following parameter must be defined:

parameter	*description*	*units*
freq	fundamental frequency of the input signal	Hz

1.3 Input

The input pins may be connected to any control signals.
The 3 signals are the instantaneous values of the dq0 representation of a 3-phase quantity.

1.4 Output

The outputs are the 3 phase values corresponding to the dq0 representation of the quantity provided as input.
The dq0 equivalent is defined in a reference frame rotating at the fundamental frequency.
The phase values are defined in the stationary reference frame.

The conversion is immediate and is calculated as follows:

$$\begin{pmatrix} a(t) \\ b(t) \\ c(t) \end{pmatrix} = \begin{pmatrix} \cos(\omega t) & -\sin(\omega t) & 1 \\ \cos(\omega t - \frac{2\pi}{3}) & -\sin(\omega t - \frac{2\pi}{3}) & 1 \\ \cos(\omega t + \frac{2\pi}{3}) & -\sin(\omega t + \frac{2\pi}{3}) & 1 \end{pmatrix} \begin{pmatrix} d(t) \\ q(t) \\ 0(t) \end{pmatrix} \quad (1)$$

where $\omega = 2\pi \cdot \text{freq}$, the angular velocity of the dq0 rotating reference frame.