

## rt\_xfmr\_y\_d.ece

### Attributes

```
mainnodes:
+   a1 b1 c1 n1
+   a2 b2 c2
rparms:
+   l1=1m
+   l2=1m
+   k=1
+   rs1=0.1
+   rs2=0.1
+   ll1=0.01m
+   ll2=0.01m
+   tstep=50u
```

### Description

`rt_xfmr_y_d.ece` is a 3-phase transformer model which includes coil resistances and leakage inductances. The two sides are denoted by 1 and 2. Side 1 has nodes `a1`, `b1`, `c1`, `n1`. Side 2 has nodes `a2`, `b2`, `c2`. The windings on the two sides are connected in the Y- $\Delta$  configuration. The parameters `l1`, `rs1`, `ll1` represent the self inductance, series resistance, and leakage inductance, respectively, of each of the coils on side 1. The parameters `l2`, `rs2`, `ll2` represent the same for the coils on side 2. `tstep` should be set to the time step used in the circuit file.

Note that, as in the single-phase case, the two sides of the transformer should be electrically connected to ensure that all node voltages in the circuit get defined with respect to a “reference node” (denoted by the `ground` element). This can be achieved, for example, by

- (a) assigning the same node name to nodes `a1` and `a2` (i.e., they become physically a single node).
- (b) connecting a resistor between a pair of nodes on either side.

It should be noted that a dummy resistor such as the one suggested above makes no difference to the currents on either side because it cannot carry a current (there being no return path).