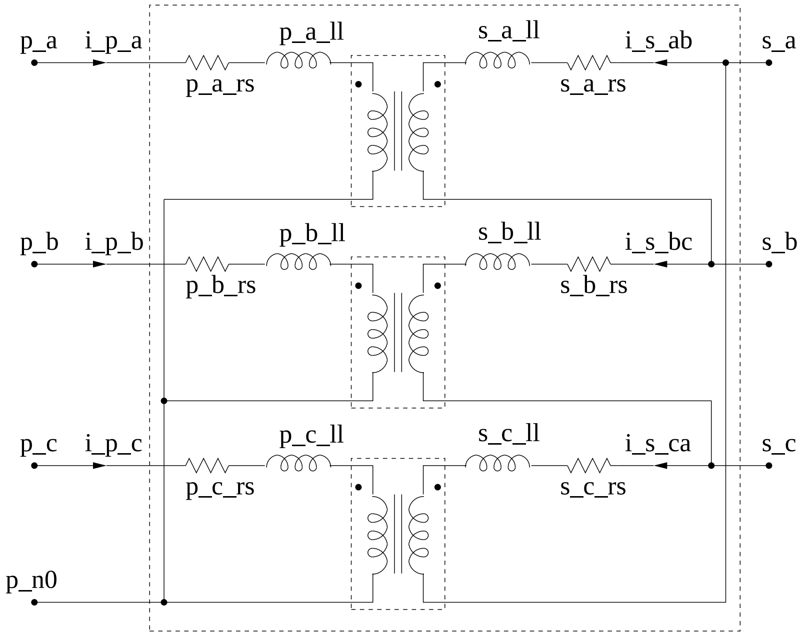
xfmr_level3_3ph_y_d.ece



Attributes

```
  mainnodes:
+   p_a p_b p_c p_n0
+   s_a s_b s_c
  outvar:
+   i_p_a=cur(p)_of_p_a_r1
+   i_p_b=cur(p)_of_p_b_r1
+   i_p_c=cur(p)_of_p_c_r1
+   i_s_ab=cur(p)_of_s_a_r1
+   i_s_bc=cur(p)_of_s_b_r1
+   i_s_ca=cur(p)_of_s_c_r1
  rparms:
+   p_a_l=1m
+   p_b_l=1m
+   p_c_l=1m
+   s_a_l=1m
+   s_b_l=1m
+   s_c_l=1m
+   a_k=1
+   b_k=1
+   c_k=1
+   p_a_rs=1m
+   p_b_rs=1m
+   p_c_rs=1m
```

```
+    s_a_rs=1m
+    s_b_rs=1m
+    s_c_rs=1m
+    p_a_ll=1n
+    p_b_ll=1n
+    p_c_ll=1n
+    s_a_ll=1n
+    s_b_ll=1n
+    s_c_ll=1n
```

Description

`xfmr_level3_3ph_y_d.ece` is a Y-Δ transformer model. It includes transformer models with coil series resistances and leakage inductances taken outside (see figure). `p_a_xxx` and `s_a_xxx` are used to denote node and parameter names for the `a` phase of the primary and secondary side, respectively, and so on. For example, `p_a_l` and `s_a_l` are self inductances for the `a` phase on the primary and secondary side, respectively. For each phase, the mutual inductance M is computed as, $M = k\sqrt{L_p L_s}$. Currents shown in the figure are made available as output variables. The model equations incorporated for each of the three transformers (dashed rectangles in the figure) are:

$$V_p = L_p \frac{di_p}{dt} + M \frac{di_s}{dt} \,, \tag{1}$$

$$V_s = L_s \frac{di_s}{dt} + M \frac{di_p}{dt} \,. \tag{2}$$

The turns ratio for each of the three transformers (dashed rectangles in the figure) is given by $N_p/N_s = \sqrt{L_p/L_s}$. Note that, by assiging suitably small values to the coil series resistances and leakage inductances, this element can be used as an ideal Y-Δ transformer.

As with other transformer elements, the user should make sure that there is a “dummy” connection between the secondary side and the primary side so that all node voltages get defined with respect to the same reference node (see comments in the help file for `xfmr_level3_1ph.ece`, for example).

AC behaviour is not implemented.