

RAZFE Model

Most of the ASEA RAZFE features are supported by the Power Factory model.

At the moment only the 1 Amp and the 5 amp rated current versions are supported in the model.

Please notice that , due to the current PowerFactory structure and data management approach the relay settings are spread in many functional blocks.

Please note that the same relay setting can be present in many blocks of the PowerFactory model so the same value must be entered everywhere.

Relationship between the relay settings and the Power Factory RAZFE model variables:

p1A, a, c (tripzone #1 - phase A):

"Z12PA" block , "replica impedance" variable (accordingly with "replica impedance" = $F_n / I_n * c * a / p1$)

"Z13PA" block , "+X Reach" variable (accordingly with $+X = F_n / I_n * c * a / p1$)

p1B, a, c (tripzone #1 - phase B):

"Z12PB" block , "replica impedance" variable (accordingly with "replica impedance" = $F_n / I_n * c * a / p1$)

"Z13PB" block , "+X Reach" variable (accordingly with $+X = F_n / I_n * c * a / p1$)

p1C, a, c (tripzone #1 - phase C):

"Z12PC" block , "replica impedance" variable (accordingly with "replica impedance" = $F_n / I_n * c * a / p1$)

"Z13PC" block , "+X Reach" variable (accordingly with $+X = F_n / I_n * c * a / p1$)

p2A, a, c (tripzone #2 - phase A):

"Z22PA" block , "replica impedance" variable (accordingly with "replica impedance" = $F_n / I_n * c * a / p1$)

"Z23PA" block , "+X Reach" variable (accordingly with $+X = F_n / I_n * c * a / p1$)

p2B, a, c (tripzone #2 - phase B):

"Z22PB" block , "replica impedance" variable (accordingly with "replica impedance" = $F_n / I_n * c * a / p1$)

"Z23PB" block , "+X Reach" variable (accordingly with $+X = F_n / I_n * c * a / p1$)

p2C, a, c (tripzone #2 - phase C):

"Z22PC" block , "replica impedance" variable (accordingly with "replica impedance" = $F_n / I_n * c * a / p1$)

"Z23PC" block , "+X Reach" variable (accordingly with $+X = F_n / I_n * c * a / p1$)

p3A, a, c (tripzone #3 - phase A):

"Z32PA" block , "replica impedance" variable (accordingly with "replica impedance" = $F_n / I_n * c * a / p1$)

"Z33PA" block , "+X Reach" variable (accordingly with $+X = F_n / I_n * c * a / p1$)

p3B, a, c (tripzone #3 - phase B):

"Z32PB" block , "replica impedance" variable (accordingly with "replica impedance" = $F_n / I_n * c * a / p1$)

"Z33PB" block , "+X Reach" variable (accordingly with $+X = F_n / I_n * c * a / p1$)

p3C, a, c (tripzone #3 - phase C):

"Z32PC" block , "replica impedance" variable (accordingly with "replica impedance" = $F_n / I_n * c * a / p1$)

"Z33PC" block , "+X Reach" variable (accordingly with $+X = F_n / I_n * c * a / p1$)

Please note that usually the same values are inserted in all phases.

b (common to all tripzones and all phases):

"Z13PA" block , "+R Resistance" variable (accordingly with the $+R = b/In$)
"Z13PB" block , "+R Resistance" variable (accordingly with the $+R = b/In$)
"Z13PC" block , "+R Resistance" variable (accordingly with the $+R = b/In$)
"Z23PA" block , "+R Resistance" variable (accordingly with the $+R = b/In$)
"Z23PB" block , "+R Resistance" variable (accordingly with the $+R = b/In$)
"Z23PC" block , "+R Resistance" variable (accordingly with the $+R = b/In$)
"Z33PA" block , "+R Resistance" variable (accordingly with the $+R = b/In$)
"Z33PB" block , "+R Resistance" variable (accordingly with the $+R = b/In$)
"Z33PC" block , "+R Resistance" variable (accordingly with the $+R = b/In$)

Kn (polarizing): "Polarizing block", "ko" variable

taun: "Polarizing block", "phiko" variable (as angle, range: 82°, 74°, 66°, 56°)

Ks (residual current signaling unit): "Starting" block, "current, 3Io" variable , the value is directly in pu

tauk: "Z13PA" block, "Earth Relay Angle" variable (as angle, range: 82°, 74°, 66°)
"Z13PB" block, "Earth Relay Angle" variable (as angle, range: 82°, 74°, 66°)
"Z13PC" block, "Earth Relay Angle" variable (as angle, range: 82°, 74°, 66°)

"Z23PA" block, "Earth Relay Angle" variable (as angle, range: 82°, 74°, 66°)
"Z23PB" block, "Earth Relay Angle" variable (as angle, range: 82°, 74°, 66°)
"Z23PC" block, "Earth Relay Angle" variable (as angle, range: 82°, 74°, 66°)

"Z33PA" block, "Earth Relay Angle" variable (as angle, range: 82°, 74°, 66°)
"Z33PB" block, "Earth Relay Angle" variable (as angle, range: 82°, 74°, 66°)
"Z33PC" block, "Earth Relay Angle" variable (as angle, range: 82°, 74°, 66°)

The impedance limit of the starting zone must be manually inserted in the "Starting circles" block, "replica impedance" variable. Accordingly to the manual the starting zone limit is 120% of the value inserted in the "replica impedance" variable for the block representing the trip zone#3 ("Z32PA", "Z32PB", "Z32PC"). The user must insert in the "replica impedance" field of the starting zone simply the value inserted in the "replica impedance" field for the block representing the trip zone#3. The 120% calculation is performed automatically using the "reach multiplier" value (fixed value = 120% in the Asea Razfe model)

Power swing: the reach of b3 and b4 must be set taking care of the 120% factor compared with b1 and b2.

The b3 and b4 settings are available inside the "mho2 left blinder" and the "mho2 right blinder" block as "Resistance" variable.