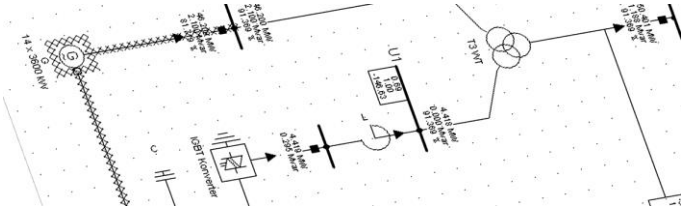

DIgSILENT Technical Documentation

Reyrolle Ohmega 4xx
PowerFactory
Relay model description

DIgSILENT GmbH
Heinrich-Hertz-Strasse 9
D-72810 Gomaringen
Tel.: +49 7072 9168 - 0
Fax: +49 7072 9168- 88
http://www.digsilent.de
e-mail: mail@digsilent.de

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Published by
DIgSILENT GmbH, Germany

doc.TechRef, Build 516 12 Januar 2021

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1 Model general description

The Reyrolle Omhega3xx relay model consists of:

- Three input blocks ("Ct", "Vt", "Ct core" block) connected to
  - One 3 phase CT.
  - One 3 phase VT.
  - One single phase CT (core CT) which can be used to feed the SEF and the DEF elements. The single phase CT can be enabled using the "Ground current selector" block (set the relevant variable in the "Logic" tab page).
- Five phase mho distance elements ("Z1 PF", "Z1X PF", "Z2 PF", "Z3 PF", "Z4 PF" block).
- Two "shape factors" acting as phase blinders and limiting distance phase zone 3 ("Z3PF Shape Factor 1" and "Z3PF Shape Factor 2" block)
- Five earth mho distance elements ("Z1 EF", "Z1X EF", "Z2 EF", "Z3 EF", "Z4 EF" block).
- Five earth polygonal distance elements ("Z1QUAD EF", "Z1XQUAD EF", "Z2QUAD EF", "Z3QUAD EF", "Z4QUAD EF" and "Dir-Z" block). Please note that the "Directional angle, phi" setting in the "Dir-Z" block must be set equal to the "Relay angle" setting of the blocks representing the distance zones.
- Four phase distance timers ("Z1 PF TD", "Z2 PF TD", "Z3 PF TD", "Z4 PF TD" block) and four earth distance timers ("Z1 EF TD", "Z2 EF TD", "Z3 EF TD", "Z4 EF TD" block).
- Polarizing feature ("Polarizing" and "Polarizing cross" block). The residual compensation settings ("Z0/Z1" and "Zo angle") must be set in both blocks. The polarizing blocks are implementing a "voltage memory" feature lasting 200 ms. Please note that when the memory expires
- One phase "High set" time defined overcurrent element ("HS" block)
- One ground sensitive time defined earth fault element ("SEF" block). Please note that an additional alarm signal is available. The alarm signal delay can be set using the "SEF Alarm" timer block. Please note that "SEF Alarm" isn't tripping the relay but is only setting the OUT2 relay output signal.
- Two ground directional time defined earth fault elements ("Fwd DEF" and "Fwd DEF Char Angle", "Rev DEF" and "Rev DEF Char Angle" block). Please note that the reset time can be set as instantaneous (setting "Reset Delay" equal to zero) or as "ANSI decaying".
- Two undervoltage time defined elements ("UV1" and "UV2" block).
- Two overvoltage time defined elements ("OV1" and "OV2" block).
- One reclosing block ("Reclosing" block). Please note that the reclosing logic can be set using the "Logic" tab page the "Reclosing" block. Two reclosing attempts are available as well a separated "dead time" for the single phase reclosing.
- One subrelay containing the "Power Swing detection logic"; both the "Rectangular" and the "Circular" shape are available. The "Circular" shape is enabled by default: to enable the "Rectangular" shape set equal to 1 the "Rectangular" variable in the "Logic" tab page of the "PSD Shape" block in the "Power Swing detection" subrelay. The "Rectangular" shape settings are located in the "Inner rectangular shape" and in the "Outer rectangular shape" block. The "Circular" shape settings are located in the "Inner Fwd blinder", "Outer Fwd blinder", "Inner Rev blinder", "Outer "Rev blinder", "Inner mho", "Outer mho" block. The "PS timer" settings is located in the "Timers" tab page ("TP1" setting) of the "Power Swing Detector" block.
- Single phase trip. The feature can be set putting equal to "TRIP" the "single_pole_trip" variable in the "Logic" tab page of the "Output Logic" block.

Three versions of the relay model, one for each rated current (1A, 2A and 5A), are available.

2 Relay not supported features

The following features are not supported:

- V.T supervision
- Synchrocheck
- Loss of load
- Switch on to fault (SOTF)

3 Reference material

The model implementation has been based on the information available in the "Ohmega 400 Series Technical Manual" documents (http://www.reyrolle-protection.com/individual_product.php?product_id=179).