PowerFactory 2021

Technical Reference

GE IAC

Contents

1 Model information

Manufacturer GE

Model IAC

Variants This family of PowerFactory relay model types simulates the following overcurrent relays manufactured for many years by General Electric:

- 50 Hz
    - IAC 51
    - IAC 52
    - IAC 53
    - IAC 54
    - IAC 55
    - IAC 60
    - IAC 66
    - IAC 77
    - IAC 78
    - IAC 95
- 60 Hz
    - IAC 51
    - IAC 52
    - IAC 53
    - IAC 54
    - IAC 55
    - IAC 60
    - IAC 66
    - IAC 77
    - IAC 78
    - IAC 80
    - IAC 90
    - IAC 95

2 General description

The GE IAC protective relays are single phase non directional ac overcurrent devices. For the user convenience the relevant PowerFactory relay models have been implemented including some 3 phase and single phase overcurrent elements which can be used to mock a set of 3 IAC devices monitoring the phase currents and an IAC device monitoring the ground current. The GE IAC family of PowerFactory relay models consists of models using three different schemes:

- *Toc Ph & Earth* scheme type: one inverse time characteristic element("Toc") for both phase and ground ("Toc" and "Toc Earth" block).

- *Toc + Ioc Ph & Earth* scheme type: one inverse time characteristic element("Toc") and one instantaneous element("Ioc") for both phase and ground ("Toc", "Ioc", "Toc Earth" and "Ioc Earth" block).

- *Toc+2Ioc Ph & Earth* scheme type: one inverse time characteristic element("Toc") and two instantaneous elements("Ioc") for both phase and ground ("Toc", "Ioc", "Ioc Hi", "Toc Earth", "Ioc Earth" and "Ioc Hi Earth" block)

These relays have been manufactured for decades and many sub type have been delivered. The PowerFactory relay library cannot cover all subtypes manufactured during the long life of the GE IAC relays but a large set of subtype is available.

They following PowerFactory relay model types can be found at \Library\Relays\Relays\Overcurrent Relays\General Electric\IAC Serie:

- 50 Hz

  - Extremely Inverse
    * IAC77A804A (scheme type: Toc Ph & Earth)
    * IAC77A805A (scheme type: Toc Ph & Earth)
    * IAC77B58A (scheme type: Toc + Ioc Ph & Earth)
    * IAC77B821A (scheme type: Toc + Ioc Ph & Earth)
    * IAC77B822A (scheme type: Toc + Ioc Ph & Earth)
    * IAC77B823A (scheme type: Toc + Ioc Ph & Earth)
    * IAC77B824A (scheme type: Toc + Ioc Ph & Earth)
    * IAC77B825A (scheme type: Toc + Ioc Ph & Earth)
    * IAC77B826A (scheme type: Toc + Ioc Ph & Earth)
    * IAC77B827A (scheme type: Toc + Ioc Ph & Earth)
    * IAC77B828A (scheme type: Toc + Ioc Ph & Earth)
    * IAC77S823A (scheme type: Toc + Ioc Ph & Earth)
    * IAC77S826A (scheme type: Toc + Ioc Ph & Earth)
    * IAC78A804A (scheme type: Toc Ph & Earth)
    * IAC78A805A (scheme type: Toc Ph & Earth)
    * IAC78B821A (scheme type: Toc + Ioc Ph & Earth)
    * IAC78B822A (scheme type: Toc + Ioc Ph & Earth)
    * IAC78B823A (scheme type: Toc + Ioc Ph & Earth)
    * IAC78B824A (scheme type: Toc + Ioc Ph & Earth)
    * IAC78B825A (scheme type: Toc + Ioc Ph & Earth)
    * IAC78B826A (scheme type: Toc + Ioc Ph & Earth)
    * IAC78B827A (scheme type: Toc + Ioc Ph & Earth)
    * IAC78B828A (scheme type: Toc + Ioc Ph & Earth)
  - Inverse
    * IAC51A804A (scheme type: Toc Ph & Earth)
    * IAC51A805A (scheme type: Toc Ph & Earth)
    * IAC51B821A (scheme type: Toc + Ioc Ph & Earth)
    * IAC51B822A (scheme type: Toc + Ioc Ph & Earth)
    * IAC51B823A (scheme type: Toc + Ioc Ph & Earth)
    * IAC51B824A (scheme type: Toc + Ioc Ph & Earth)

* IAC51B825A (scheme type: Toc + Ioc Ph & Earth)
* IAC51B826A (scheme type: Toc + Ioc Ph & Earth)
* IAC51B827A (scheme type: Toc + Ioc Ph & Earth)
* IAC51B828A (scheme type: Toc + Ioc Ph & Earth)
* IAC51N103 (scheme type: Toc Ph & Earth)
* IAC51N104A (scheme type: Toc Ph & Earth)
* IAC51N10A (scheme type: Toc Ph & Earth)
* IAC51N119A (scheme type: Toc Ph & Earth)
* IAC51N18A (scheme type: Toc Ph & Earth)
* IAC51N9A (scheme type: Toc Ph & Earth)
* IAC51V102A (scheme type: Toc + Ioc Ph & Earth)
* IAC52A804A (scheme type: Toc Ph & Earth)
* IAC52A805A (scheme type: Toc Ph & Earth)
* IAC52B821A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B822A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B823A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B824A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B825A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B826A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B827A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B828A (scheme type: Toc + Ioc Ph & Earth)
* IAC60A113A (scheme type: Toc Ph & Earth)
* IAC60A14A (scheme type: Toc Ph & Earth)
* IAC60A16A (scheme type: Toc Ph & Earth)
* IAC60B117A (scheme type: Toc + Ioc Ph & Earth)
* IAC60B118A (scheme type: Toc + Ioc Ph & Earth)
* IAC60B119A (scheme type: Toc + Ioc Ph & Earth)
– Long Time Inverse
    * IAC66A54A (scheme type: Toc Ph & Earth)
    * IAC66A56A (scheme type: Toc Ph & Earth)
    * IAC66B58A (scheme type: Toc + Ioc Ph & Earth)
    * IAC66B59A (scheme type: Toc + Ioc Ph & Earth)
    * IAC66B60A (scheme type: Toc + Ioc Ph & Earth)
    * IAC66C58A (scheme type: Toc + Ioc Ph & Earth)
    * IAC66C59A (scheme type: Toc + Ioc Ph & Earth)
    * IAC66C60A (scheme type: Toc + Ioc Ph & Earth)
    * IAC66K54A (scheme type: Toc+2Ioc Ph & Earth)
    * IAC66K61A (scheme type: Toc+2Ioc Ph & Earth)
    * IAC66K62A (scheme type: Toc+2Ioc Ph & Earth)
    * IAC66K63A (scheme type: Toc+2Ioc Ph & Earth)
    * IAC66K71A (scheme type: Toc+2Ioc Ph & Earth)
    * IAC66K72A (scheme type: Toc+2Ioc Ph & Earth)
    * IAC66M63A (scheme type: Toc+2Ioc Ph & Earth)
    * IAC66M64A (scheme type: Toc+2Ioc Ph & Earth)
    * IAC66M65A (scheme type: Toc+2Ioc Ph & Earth)
    * IAC66M67A (scheme type: Toc+2Ioc Ph & Earth)
– Short Time Inverse
    * IAC55A104A (scheme type: Toc Ph & Earth)

* IAC55A5A (scheme type: Toc Ph & Earth)
* IAC55A6A (scheme type: Toc + Ioc Ph & Earth)
* IAC55B105A (scheme type: Toc + Ioc Ph & Earth)
* IAC55B108A (scheme type: Toc + Ioc Ph & Earth)
* IAC55B122A (scheme type: Toc + Ioc Ph & Earth)
* IAC55B14A (scheme type: Toc + Ioc Ph & Earth)
* IAC55B22A (scheme type: Toc + Ioc Ph & Earth)
* IAC55B6A (scheme type: Toc + Ioc Ph & Earth)
* IAC55B7A (scheme type: Toc + Ioc Ph & Earth)
* IAC55F5A (scheme type: Toc + Ioc Ph & Earth)
* IAC95F2A (scheme type: Toc + Ioc Ph & Earth)

– Very Inverse

* IAC53A801A (scheme type: Toc Ph & Earth)
* IAC53A803A (scheme type: Toc Ph & Earth)
* IAC53B61A (scheme type: Toc + Ioc Ph & Earth)
* IAC53B801A (scheme type: Toc + Ioc Ph & Earth)
* IAC53B803A (scheme type: Toc + Ioc Ph & Earth)
* IAC53B805A (scheme type: Toc + Ioc Ph & Earth)
* IAC53B807A (scheme type: Toc + Ioc Ph & Earth)
* IAC53B809A (scheme type: Toc + Ioc Ph & Earth)
* IAC53B810A (scheme type: Toc + Ioc Ph & Earth)
* IAC53B811A (scheme type: Toc + Ioc Ph & Earth)
* IAC53B812A (scheme type: Toc + Ioc Ph & Earth)
* IAC53T801A (scheme type: Toc + Ioc Ph & Earth)
* IAC53T802A (scheme type: Toc + Ioc Ph & Earth)
* IAC53T803A (scheme type: Toc + Ioc Ph & Earth)
* IAC53T804A (scheme type: Toc + Ioc Ph & Earth)
* IAC53T805A (scheme type: Toc + Ioc Ph & Earth)
* IAC53T806A (scheme type: Toc + Ioc Ph & Earth)
* IAC53T807A (scheme type: Toc + Ioc Ph & Earth)
* IAC53T808A (scheme type: Toc + Ioc Ph & Earth)
* IAC54A801A (scheme type: Toc + Ioc Ph & Earth)
* IAC54A803A (scheme type: Toc + Ioc Ph & Earth)
* IAC54B801A (scheme type: Toc Ph & Earth)
* IAC54B803A (scheme type: Toc Ph & Earth)
* IAC54B805A (scheme type: Toc + Ioc Ph & Earth)
* IAC54B807A (scheme type: Toc + Ioc Ph & Earth)
* IAC54B809A (scheme type: Toc + Ioc Ph & Earth)
* IAC54B810A (scheme type: Toc + Ioc Ph & Earth)
* IAC54B811A (scheme type: Toc + Ioc Ph & Earth)
* IAC54B812A (scheme type: Toc + Ioc Ph & Earth)
* IAC54B813A (scheme type: Toc + Ioc Ph & Earth)
* IAC80L4A (scheme type: Toc + Ioc Ph & Earth)

• 60 Hz

– Extremely Inverse

* IAC77A15A (scheme type: Toc Ph & Earth)
* IAC77A801A (scheme type: Toc Ph & Earth)

* IAC77A803A (scheme type: Toc Ph & Earth)
* IAC77B55A (scheme type: Toc + Ioc Ph & Earth)
* IAC77B57A (scheme type: Toc + Ioc Ph & Earth)
* IAC77B60A (scheme type: Toc + Ioc Ph & Earth)
* IAC77B69A (scheme type: Toc + Ioc Ph & Earth)
* IAC77B71A (scheme type: Toc + Ioc Ph & Earth)
* IAC77B73A (scheme type: Toc + Ioc Ph & Earth)
* IAC77B801A (scheme type: Toc + Ioc Ph & Earth)
* IAC77B803A (scheme type: Toc + Ioc Ph & Earth)
* IAC77B805A (scheme type: Toc + Ioc Ph & Earth)
* IAC77B807A (scheme type: Toc + Ioc Ph & Earth)
* IAC77B809A (scheme type: Toc + Ioc Ph & Earth)
* IAC77B810A (scheme type: Toc + Ioc Ph & Earth)
* IAC77B811A (scheme type: Toc + Ioc Ph & Earth)
* IAC77B812A (scheme type: Toc + Ioc Ph & Earth)
* IAC77M3A (scheme type: Toc + Ioc Ph & Earth)
* IAC77M4A (scheme type: Toc + Ioc Ph & Earth)
* IAC77M5A (scheme type: Toc + Ioc Ph & Earth)
* IAC78A7A (scheme type: Toc Ph & Earth)
* IAC78A801A (scheme type: Toc Ph & Earth)
* IAC78A803A (scheme type: Toc Ph & Earth)
* IAC78B801A (scheme type: Toc + Ioc Ph & Earth)
* IAC78B803A (scheme type: Toc + Ioc Ph & Earth)
* IAC78B805A (scheme type: Toc + Ioc Ph & Earth)
* IAC78B807A (scheme type: Toc + Ioc Ph & Earth)
* IAC78B809A (scheme type: Toc + Ioc Ph & Earth)
* IAC78B810A (scheme type: Toc + Ioc Ph & Earth)
* IAC78B811A (scheme type: Toc + Ioc Ph & Earth)
* IAC78B812A (scheme type: Toc + Ioc Ph & Earth)
* IAC90B1A (scheme type: Toc + Ioc Ph & Earth)
* IAC90B2A (scheme type: Toc + Ioc Ph & Earth)
* IAC90T1A (scheme type: Toc + Ioc Ph & Earth)
* IAC90T2A (scheme type: Toc + Ioc Ph & Earth)

– Inverse

* IAC51A801A (scheme type: Toc Ph & Earth)
* IAC51A802A (scheme type: Toc Ph & Earth)
* IAC51B801A (scheme type: Toc + Ioc Ph & Earth)
* IAC51B802A (scheme type: Toc + Ioc Ph & Earth)
* IAC51B803A (scheme type: Toc + Ioc Ph & Earth)
* IAC51B804A (scheme type: Toc + Ioc Ph & Earth)
* IAC51B805A (scheme type: Toc + Ioc Ph & Earth)
* IAC51B806A (scheme type: Toc + Ioc Ph & Earth)
* IAC51B807A (scheme type: Toc + Ioc Ph & Earth)
* IAC51B808A (scheme type: Toc + Ioc Ph & Earth)
* IAC51N101A (scheme type: Toc Ph & Earth)
* IAC51N102A (scheme type: Toc Ph & Earth)
* IAC51N111A (scheme type: Toc Ph & Earth)
* IAC51N13A (scheme type: Toc Ph & Earth)

* IAC51N14A (scheme type: Toc Ph & Earth)
* IAC51N16A (scheme type: Toc Ph & Earth)
* IAC51N17A (scheme type: Toc Ph & Earth)
* IAC51N7A (scheme type: Toc Ph & Earth)
* IAC51N8A (scheme type: Toc Ph & Earth)
* IAC51V101A (scheme type: Toc + Ioc Ph & Earth)
* IAC51V104A (scheme type: Toc + Ioc Ph & Earth)
* IAC51V105A (scheme type: Toc + Ioc Ph & Earth)
* IAC51V106A (scheme type: Toc + Ioc Ph & Earth)
* IAC51V2A (scheme type: Toc + Ioc Ph & Earth)
* IAC51V3A (scheme type: Toc + Ioc Ph & Earth)
* IAC51V5A (scheme type: Toc + Ioc Ph & Earth)
* IAC51V6A (scheme type: Toc + Ioc Ph & Earth)
* IAC52A801A (scheme type: Toc Ph & Earth)
* IAC52A802A (scheme type: Toc Ph & Earth)
* IAC52B801A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B802A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B803A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B804A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B805A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B806A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B807A (scheme type: Toc + Ioc Ph & Earth)
* IAC52B808A (scheme type: Toc + Ioc Ph & Earth)
* IAC60A111A (scheme type: Toc Ph & Earth)
* IAC60A12A (scheme type: Toc Ph & Earth)
* IAC60A15A (scheme type: Toc Ph & Earth)
* IAC60B112A (scheme type: Toc + Ioc Ph & Earth)
* IAC60B114A (scheme type: Toc + Ioc Ph & Earth)
* IAC60B115A (scheme type: Toc + Ioc Ph & Earth)
* IAC60B11A (scheme type: Toc + Ioc Ph & Earth)
* IAC60B13A (scheme type: Toc + Ioc Ph & Earth)
* IAC60B15A (scheme type: Toc + Ioc Ph & Earth)
* IAC60B16A (scheme type: Toc + Ioc Ph & Earth)
* IAC60B20A (scheme type: Toc + Ioc Ph & Earth)
* IAC60B21A (scheme type: Toc + Ioc Ph & Earth)
* IAC60T1A (scheme type: Toc + Ioc Ph & Earth)
* IAC60T2A (scheme type: Toc + Ioc Ph & Earth)
* IAC60T3A (scheme type: Toc + Ioc Ph & Earth)

- **Long Time Inverse**
  * IAC66A51A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66A52A (scheme type: Toc Ph & Earth)
  * IAC66A53A (scheme type: Toc Ph & Earth)
  * IAC66B51A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66B52A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66B53A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66B54A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66B55A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66B56A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66B57A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66C51A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66C52A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66C53A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66C54A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66C55A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66C56A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66C57A (scheme type: Toc + Ioc Ph & Earth)
  * IAC66K51A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K52A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K53A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K55A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K56A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K57A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K58A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K59A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K60A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K64A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K65A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K67A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K68A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K69A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66K70A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66M51A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66M52A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66M53A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66M54A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66M55A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66M56A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66M57A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66M58A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66M59A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66M60A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66M61A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66M62A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66T51A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66T52A (scheme type: Toc+2Ioc Ph & Earth)
  * IAC66T53A (scheme type: Toc+2Ioc Ph & Earth)

* IAC66T54A (scheme type: Toc+2loc Ph & Earth)
* IAC66T55A (scheme type: Toc+2loc Ph & Earth)
* IAC66T56A (scheme type: Toc+2loc Ph & Earth)
* IAC66T57A (scheme type: Toc+2loc Ph & Earth)

– Short Time Inverse

* IAC55A101A (scheme type: Toc Ph & Earth)
* IAC55A2A (scheme type: Toc Ph & Earth)
* IAC55A3A (scheme type: Toc Ph & Earth)
* IAC55B101A (scheme type: Toc + loc Ph & Earth)
* IAC55B104A (scheme type: Toc + loc Ph & Earth)
* IAC55B10A (scheme type: Toc + loc Ph & Earth)
* IAC55B115A (scheme type: Toc + loc Ph & Earth)
* IAC55B121A (scheme type: Toc + loc Ph & Earth)
* IAC55B17A (scheme type: Toc + loc Ph & Earth)
* IAC55B19A (scheme type: Toc + loc Ph & Earth)
* IAC55B20A (scheme type: Toc + loc Ph & Earth)
* IAC55B25A (scheme type: Toc + loc Ph & Earth)
* IAC55B2A (scheme type: Toc + loc Ph & Earth)
* IAC55B3A (scheme type: Toc + loc Ph & Earth)
* IAC55B9A (scheme type: Toc + loc Ph & Earth)
* IAC55F1A (scheme type: Toc + loc Ph & Earth)
* IAC55F2A (scheme type: Toc + loc Ph & Earth)
* IAC55F3A (scheme type: Toc + loc Ph & Earth)
* IAC55F4A (scheme type: Toc + loc Ph & Earth)
* IAC55F6A (scheme type: Toc + loc Ph & Earth)
* IAC55F7A (scheme type: Toc + loc Ph & Earth)
* IAC95F1A (scheme type: Toc + loc Ph & Earth)

– Very Inverse

* IAC53A10A (scheme type: Toc Ph & Earth)
* IAC53A19A (scheme type: Toc Ph & Earth)
* IAC53A801A (scheme type: Toc Ph & Earth)
* IAC53A803A (scheme type: Toc Ph & Earth)
* IAC53B32A (scheme type: Toc + loc Ph & Earth)
* IAC53B34A (scheme type: Toc + loc Ph & Earth)
* IAC53B38A (scheme type: Toc + loc Ph & Earth)
* IAC53B50A (scheme type: Toc + loc Ph & Earth)
* IAC53B54A (scheme type: Toc + loc Ph & Earth)
* IAC53B76A (scheme type: Toc + loc Ph & Earth)
* IAC53B78A (scheme type: Toc + loc Ph & Earth)
* IAC53B801A (scheme type: Toc + loc Ph & Earth)
* IAC53B803A (scheme type: Toc + loc Ph & Earth)
* IAC53B805A (scheme type: Toc + loc Ph & Earth)
* IAC53B807A (scheme type: Toc + loc Ph & Earth)
* IAC53B809A (scheme type: Toc + loc Ph & Earth)
* IAC53B810A (scheme type: Toc + loc Ph & Earth)
* IAC53B811A (scheme type: Toc + loc Ph & Earth)
* IAC53B812A (scheme type: Toc + loc Ph & Earth)
* IAC53M101A (scheme type: Toc + loc Ph & Earth)

- ∗ IAC53M102A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53M103A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53M10A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53M11A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53M3A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53M4A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53M5A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53M6A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53M7A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53M9A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53T801A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53T802A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53T803A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53T804A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53T805A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53T806A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53T807A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC53T808A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC54A10A (scheme type: Toc Ph & Earth)
- ∗ IAC54A801A (scheme type: Toc Ph & Earth)
- ∗ IAC54A803A (scheme type: Toc Ph & Earth)
- ∗ IAC54B801A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC54B803A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC54B805A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC54B807A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC54B809A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC54B810A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC54B811A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC54B812A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC54B813A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC80L1A (scheme type: Toc Ph & Earth)
- ∗ IAC80L2A (scheme type: Toc Ph & Earth)
- ∗ IAC80L3A (scheme type: Toc Ph & Earth)
- ∗ IAC80P1A (scheme type: Toc Ph & Earth)
- ∗ IAC80P2A (scheme type: Toc Ph & Earth)
- ∗ IAC80P3A (scheme type: Toc Ph & Earth)
- ∗ IAC80T1A (scheme type: Toc + Ioc Ph & Earth)
- ∗ IAC80T2A (scheme type: Toc + Ioc Ph & Earth)

The model implementation has been based on the information available in the relay documentation [1] [2] [3] [4] [5] [6] [7]

3   Supported features

3.1   Measurement and acquisition

It represents the interface between the power system and the relay protective elements. The currents flowing in the power system are converted by an element simulating a 3 phase CT.

3.1.1 Available Units

- one 3ph current transformer ("Ct-3P/3xI0" block in the "Toc + Ioc Ph & Earth" and in the "Toc+2Ioc Ph & Earth" scheme, "Ct" block in the "Toc Ph & Earth" scheme)

- one phase measurement element ("Measurement Type" block)

3.1.2 Functionality

The "Ct" and the "Ct-3P/3xI0" block represent an ideal CT. Using the CT default configuration the current at the primary side are converted to the secondary side using the CT ratio. The CT saturation and/or its magnetizing characteristic are not considered. Please set the "Detailed Model" check box in the "Detailed Data" tab page of the CT dialog and insert the data regarding the CT burden, the CT secondary resistance and the CT excitation parameter if more accurate simulation results are required. The measurement block simulate a second order low pass analog filter with DC component filter; its time constant is 1 ms.

3.1.3 Data input

No user input is required

3.2 Protective elements

A set of inverse time and instantaneous overcurrent elements is modeling the relay protective functions. The inverse characteristics available in the relays are available as well in the inverse time model blocks.

3.2.1 Available Units

- *Toc Ph & Earth* scheme type

    - one 3 phase inverse time overcurrent element("Toc" block)
    - one zero sequence inverse time overcurrent element("Toc Earth" block)

- *Toc + Ioc Ph & Earth* scheme type

    - one 3 phase inverse time overcurrent element("Toc" block)
    - one zero sequence inverse time overcurrent element("Toc Earth" block)
    - one 3 phase instantaneous overcurrent element("Ioc" block)
    - one zero sequence instantaneous overcurrent elements("Ioc Earth" block)

- *Toc+2Ioc Ph & Earth* scheme type

    - one 3 phase inverse time overcurrent element("Toc" block)
    - one zero sequence inverse time overcurrent element("Toc Earth" block)
    - one 3 phase instantaneous overcurrent element("Ioc" and "Ioc Hi" block)
    - one zero sequence instantaneous overcurrent elements("Ioc Earth" and "Ioc Hi Earth" block)

3.2.2   Functionality

Each protective relay of the GE IAC family support an unique tripping characteristics. The following tripping characteristics are available in the PowerFactory relay model types:

- IAC Extremely Inverse GES7005B

- IAC Inverse GES7001B

- IAC Long Time Inverse GES7004B

- IAC Short Inverse GES7003A

- IAC Very Inverse GES7002B

3.2.3   Data input

The relationships between the relay settings and the model parameters can be found in the following tables.

Toc Ph & Earth scheme type:

Address	Relay Setting	Model block	Model setting	Note
	Pickup (Tap)	Toc	Current Setting	
		Toc Earth	Current Setting	
	Time Dial	Toc	Time Dial	
		Toc Earth	Time Dial	

Toc + Ioc Ph & Earth scheme type:

Address	Relay Setting	Model block	Model setting	Note
	Pickup (Tap)	Toc	Current Setting	
		Toc Earth	Current Setting	
	Time Dial	Toc	Time Dial	
		Toc Earth	Time Dial	
	Instantaneous Pickup	Ioc	Pickup Current	
		Ioc Earth	Pickup Current	

Toc+2Ioc Ph & Earth scheme type:

Address	Relay Setting	Model block	Model setting	Note
	Pickup (Tap)	Toc	Current Setting	
		Toc Earth	Current Setting	
	Time Dial	Toc	Time Dial	
		Toc Earth	Time Dial	
	Instantaneous Pickup	Ioc	Pickup Current	
		Ioc Earth	Pickup Current	
		Ioc Hi	Pickup Current	
		Ioc Hi Earth	Pickup Current	

3.3   Output logic

It represents the output stage of the relay; it's the interface between the relay and the power breaker.

3.3.1   Available Units

- one output logic element ("Logic Type" block)

3.3.2   Functionality

The "Logic Type" block is collecting the trip signals coming from the protective elements and is operating the relay output contact. The output contact is named "yout".

3.3.3   Data input

No user input is required. To disable the relay model ability to open the power circuit breaker simply disable the "Logic Type" block.

4   Features not supported

The following features are not supported:

- Delayed reset time of the inverse time characteristic

5   References

[1] GE Power Management, 215 Anderson Avenue, Markham, Ontario, Canada L6E 1B3. *INSTRUCTIONS TIME OVERCURRENT RELAYS TYPES IAC51A FORM 800 AND UP IAC51B FORM 800 AND UP IAC52A FORM 800 AND UP IAC52B FORM 800 AND UP(GEK-34053G).*

[2] GE Power Management, 215 Anderson Avenue, Markham, Ontario, Canada L6E 1B3. *INSTRUCTIONS TYPE IAC TIME OVERCURRENT RELAYS TYPES IAC66A IAC66B IAC66C (GEK-86054C).*

[3] GENERAL ELECTRIC CO. POWERS SYSTEMS MANAGEMENT, MALVERN PA, 19355 US. *INSTRUCTIONS TIME OVERCURRENT RELAYS TYPES IAC53A IAC53R IAC53B IAC54A IAC53C IAC54B (GEH-1788L).*

[4] GENERAL ELECTRIC METER AND CONTROL BUSINESS DEPT., 215 Anderson Avenue, Markham, Ontario, Canada L6E 1B3. *INSTRUCTIONS TIME OVERCURRENT RELAY MODEL 12IAC95F TYPE IAC (GEK-41852A).*

[5] GENERAL ELECTRIC METER AND CONTROL BUSINESS DEPT., MALVERN PA, 19355 US. *INSTRUCTIONS TIME OVERCURRENT RELAY TYPE IAC MODEL 12IAC80L (GEK-27870).*

[6] GENERAL ELECTRIC METER AND CONTROL BUSINESS DEPT., MALVERN PA, 19355 US. *INSTRUCTIONS TIME OVERCURRENT RELAY WITH TORQUE CONTROL TYPE IAC MODEL 12IAC90A 12IAC90B (GEK-28046A).*

[7] GENERAL ELECTRIC METER AND CONTROL BUSINESS DEPT., MALVERN PA, 19355 US. *INSTRUCTIONS TIME OVERCURRENT RELAYS TYPES IAC77A IAC77B IAC78A IAC77B (GEH-2059C).*