DRL

ARC SUPPRESSION COIL CONTROLLER

Overview

The DRL devices provide complex, numerical controller automation for arc suppression coils (Petersen coils); consequently, they can be applied in resonance-grounded networks. The controller tunes the coil by moving the iron core.
The DRL configuration is a member the DAUT product type. Devices of this type are configured for various automation purposes of the electric power system.

Because of the modular architecture, the modules are assembled and configured according to the user's requirements; from that point on, the software determines the functions.

The EuroCAP configuration tool, which is available free of charge, offers a user-friendly and flexible application for protection, control and measurement functions to ensure that the IED-EP+ devices are fully customizable.

GENERAL FEATURES

- Native IEC 61850 IED with Edition 2 compatibility
- Scalable hardware to adapt to different applications
- 84 HP or 42HP wide rack size (height: 3U)
- The pre-defined factory configuration can be customized to the user's specification with the powerful EuroCAP tool
- Flexible protection and control functionality to meet special customer requirements
- Advanced HMI functionality via color touchscreen and embedded WEB server, extended measuring, control and monitoring functions
- User configurable LCD user screens, which can display SLDs (Single Line Diagrams) with switchgear position indication and control as well as measuring values and several types of controllable objects.
- Various protection setting groups available
- Enhanced breaker monitoring and control
- High capacity disturbance recorder (DRE) and event logging:
  - DRE for up to 32 analogue and 64 digital signal channels.
  - Event recorder can store more than 10,000 events.
- Several mounting methods: Rack; Flush mounting; Semi-flush mounting; Wall mounting; Wall-mounting with terminals; Flush mounting with IP54 rated cover.
- Wide range of communication protocols:
  - Ethernet-based communication: IEC61850; IEC60870-5-104; DNP3.0 TCP; Modbus TCP
  - Serial communication: DNP3.0; IEC60870-5-101/103; MODBUS, SPA
- The EuroProt+ family can handle several communication protocols simultaneously.
- Built-in self-monitoring to detect internal hardware or software errors
- Different time sources available: NTP server; Minute pulse; Legacy protocol master; IRIG-B000 or IRIG-B12X

Application

The compensation of the earth fault current in distribution networks is an effective method to automatically clear single phase-to-neutral faults, the most frequent fault type. However, the application of the arc suppression coil can be effective only if the inductive reactance of the coil is nearly the same as the zero sequence capacitive reactance of the given network. Thus in case of an earth fault a resonance situation evolves where the magnitude of the earth

fault current is low.

To achieve this aim it is necessary to determinate the zero sequence parameters of the network. The DRL device applies the modern current injection method for this purpose.
The injection transformer and its controller fit into one 84HP wide rack together with the other necessary modules of the device.

The configuration contains a zero sequence overvoltage function in order to detect the presence of earth faults on the network and block the control process to defend the Petersen coil.

DRL devices can communicate with each other on Ethernet network; therefore the parallel control of two Petersen coils on the same network is possible.

SCOPE OF APPLICATION

- Automatic control of arc suppression coils of the compensated networks based on measuring the zero sequence parameters of the network.
- The device uses the method of current injection for measuring.
- Zero sequence overvoltage function for detecting the presence of earth faults on the network.
- Parallel control of two coils on the same network with communication between the DRL devices.

Protection and control

The DRL device can establish changes in the network based on detecting the change of the zero sequence voltage. When a change in the network is established, the device determines the zero sequence parameters of the network with current injection, from the zero sequence voltage change following the injection.

The position of the arc suppression coil is calculated from the direct measurement of the potentiometer resistance. If it is different from the target value that is derived from the settings and the measurement of network parameters, the DRL device issues a control command.

The control process is blocked if the value of the zero sequence voltage indicates an earth fault on the network.

The implemented protection & control functions

Protection & control functions	IEC	ANSI	*Inst.
DRL - Numerical arc supression coil controller function block description	-	-	1
Residual definite time overvoltage protection function	Uo›	59N	1

*The ‘INST.’ column contains the numbers of the pre-configured function blocks in the factory configuration.These numbers may be different in order to meet the user’s requirements.

Conatct us

For more information, please refer to the DRL configuration description document or contact us:

Protecta Electronics Ltd.
Address: Késmárk u. 7/A, 1158 Budapest, Hungary
Post Address: 1601 Budapest, Pf. 74., Hungary
Phone: (+36 1) 415 3800
E-mail: protecta@protecta.hu

QR code of our website:

PROTECTA HUNGARY

PROTECTION, AUTOMATION & CONTROL
FOR POWER INDUSTRY