DTI-HV-EP

NUMERICAL LINE DIFFERENTIAL PROTECTION AND OVERCURRENT PROTECTION

1 Application

The **DTI-HV-EP** complex numerical device is pre-configured for a three-phase definite time overcurrent protection with earth-fault overcurrent protection and over/undervoltage protection functions. This device can be applied in all areas of the electric power system with solidly grounded neutral.

The line differential protection function of the **DTI-HV-EP** version is a three-phase line differential protection, which needs fibre optic cable connection between the line ends. It can be applied as the selective and high-speed protection function of transmission lines to clear internal faults. If it is applied, the overcurrent protection functions of the factory configuration serve as backup protection if the fibre optic connection fails to communicate the needed information.

For the application of the differential protection function, the device must be extended with the „OX" high power, fibre optic transmitter/receiver module.

The additional supervisory and control functions (SCADA) extend the device to a complex field unit.

2 Features

The main features of **DTI-HV-EP** complex protection are as follows:

2.1 The implemented functions in the protection part of the complex device:

- Line differential protection function, which communicates in master-slave configuration with the other device located on the far line end,
- three-phase, definite time overcurrent protection, high current setting stage (I>>),
- three-phase, definite time overcurrent protection, low current setting stage (I>),
- zero sequence overcurrent function, high current setting stage (3Io>>),
- zero sequence overcurrent function, low current setting stage (3Io>), can be set for directional earth-fault protection as well,
- zero sequence overvoltage protection,
- over/undervoltage protection based on the phase voltages.

2.2 Features of the protection functions:

- the setting value and time delay of the functions can be set independently of each other,
- the start signal and the trip command of the protection functions can be generated individually for the phases in case of single phase faults, or can be set for three-phase operation for all kinds of faults,
- all two-phase fault detections generate three-phase trip command,
- the zero sequence overcurrent stages generate three-phase trip command.

2.3 Additional features:

- Trip matrix,
- PROTLOG equations.
- Continuous and cyclic self-check functions are implemented; the supervision can be extended to the current transformer circuits and to the trip circuits as well.
- The integrated event recorder can store up to 50 evaluated events and up to 300 digital events with 1 ms time resolution.
- An integrated real-time clock is implemented with battery supported RAM. The clock can be synchronised by external PC or by the supervisory and control system, and additionally a Word Time Synchroniser (GPS-OP) produced by PROTECTA Co. Ltd can be ordered optionally.
- The integrated disturbance recorder of the CPU module can store up to 11 records, the total time of which is about 10 s.
- The device implements several measuring functions based on the available analogue signals.

2.4 The features of the supervisory and control functions:

- the supervisory and control functions are implemented in a dedicated processor, located on the Central Processing Unit (CPU) of the device,
- the optional large graphic LCD realises full-scale local control unit for the bay,
- the supervisory and control functions are as follows:
  - control of switching devices:
  - local and remote operation,
  - interlocking functions,
  - generation of status signals,
  - event logging,
  - protective command transmission,
  - communication with the intelligent graphic display,
  - transmission of protection signals to the supervisory and control system,
  - transmission of commands signals from the supervisory and control system, and their execution,
  - receipt of commands from the graphic LCD and their execution.

3 Technical data

General technical specification see in **EuroProt system information sheet**
Type tests see in **EuroProt system information sheet**
Design and sizes see in **EuroProt system information sheet**

4 Ordering information

- Type of protection [DTI-HV-EP]
- Rated C.T. current [1 A, 5 A]
- Rated V.T. voltage [100 V, 200 V]
- Design type [19 inch cabinet frame mounted device, panel mounted device with flash mounted form, panel mounted device with raised-hinged form]
- Auxiliary DC voltage [220 V, 110 V, or other]