

# DTI2-OP



## NUMERICAL OVERCURRENT PROTECTION



### *Field of application*

The **OmegaProt** compact devices belong to the smallest, numerical type device family produced by PROTECTA Co. Ltd. Due to the compact design the place requirement is small, so they can be applied in narrow locations as well. The application is more economic than the complex products of other types, if the protection requirement allows usage of few inputs and outputs. Because of the small size, the hardware configuration has considerable limitations as compared to the modular **EuroProt** devices.

This information sheet describes the individual characteristics of a specific application: the factory configuration **DTI2-OP** numerical overcurrent protection. The general description of the members of the **OmegaProt** type complex protection family can be found in document "**OmegaProt** complex protection, hardware and software description and user's manual" (further "**OmegaProt manual**").

The digital complex overcurrent protection of type **DTI-2 OP** with definite time or standard IDMT characteristics is used in generating stations, transmission and distribution substations and at the consumers of the electric power system, where short circuits, faults or abnormal operations cause overcurrent exceeding the rated current. Typical application field is phase fault and ground fault protection, back up protection and protection against overloading.

## *Main features*

- The phase fault protection is designed as three or two phase (  $3x[I>, I>>]$ ;  $2x[I>, I>>]$  ) overcurrent protection,
- The two phase type may be also extended by  $3I_{0>}$ ,  $3I_{0>>}$  zero sequence overcurrent functions ( $2Ph + I_0$ ),
- If only earth fault protection is required, the  $3I_{0>}$  relay can be extended with zero sequence directional function as well ( $I_0 \phi$ ),
- The overcurrent stages can be set and enabled independently of each other
- The characteristics can be definite time or standard inverse type characteristics,
- The standard versions of inverse characteristics can be set to normal inverse very inverse, extremely inverse and long time earth fault inverse characteristics,
- With the help of a software matrix, each starting states and trip commands of the overcurrent functions and the two additional timers can be directed to the output relays,
- The overcurrent can be set in per cent of the main C.T. rated value,
- For the zero sequence directional function the operation field (greatest and smallest angle values) as well as hysteresis angle range (resetting ratio) of the zero sequence angle relay can be set,
- The protection is provided with automatic and manually started self monitoring system,
- Eight LED gives information about operation and there are four output relays, any of which can be programmed for latching,
- It can be programmed (set) via optical fibre cable only,
- The handling is performed by an external PC (e.g. by a laptop) or by a central computer (e.g. SCADA).

Based on the information above, the following versions are available:

**DTI2-OP-3Ph,**  
**DTI2-OP-2Ph,**  
**DTI2-OP-2Ph  $I_0$ ,**  
**DTI2-OP- $I_0 \phi$ ,**

## *Design*

The DTI2-OP overcurrent protection is built into a closed dustproof steel case. The case can be mounted to a standard  $\Omega$  rail, the width in the rail is 120 mm. 16 terminals are placed on the front plate of case, through them the external connection can be made. The optical fibre cable connections are located on the upper part of the front plate.

## *Setting and supervising*

Setting and checking of protection, reading operating information, events and signals, setting of the software matrix, and handling of signals (messages) is possible with external PC or other external computer. Protecta Co. Ltd. delivers the operating software (Protect for Windows) together with the DTI2-OP protection.

## *Technical Data*

General technical specification see in <b>OmegaProt system information sheet</b>
Type tests see in <b>OmegaProt system information sheet</b>
Design and sizes see in <b>OmegaProt system information sheet</b>

<b>Setting ranges:</b>	
Overcurrent relays, setting range (in per cent of main C.T. primary rated current)	
phase relais	50...2500 %, steps 5 %
zero sequence relais	10...104 %, steps 2 %
zero sequence relais at toroidal type C.T.	10...104 ‰, steps 2 ‰
Timers, setting range, overcurrent relais	0...60000 ms, steps 10 ms
IDMT characteristics	
Normal inverse	$t = k \frac{0,14}{I^{0,02} - 1}$
Very inverse	$t = k \frac{13,5}{I - 1}$
Extreme inverse	$t = k \frac{80}{I^2 - 1}$
Time constant setting range	k= 0,02-1, steps 0,02

## *Size*

Widht	Height	Depth
120 mm	90 mm	80 mm

## *Ordering information*

- Type of protection [DTI2-OP]
- Rated C.T. current [1 A, 5 A]
- Rated zero sequence C.T. current [main C.T., toroidal type C.T.]
- Version [DTI2-OP-3Ph, DTI2-OP-2Ph, DTI2-OP-2Ph I<sub>0</sub>, DTI2-OP-I<sub>0</sub> φ]
- The D.C. (logical) bus-bar differential protection contact is NC or NO type?