

LINE DIFFERENTIAL RELAY WITH BACK-UP DISTANCE PROTECTION GRL100

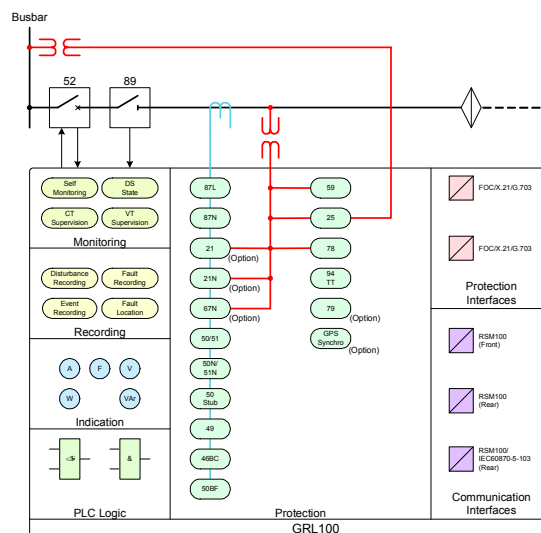
TOSHIBA

...announces new features in its GRL100 numerical line differential protection, now available with back-up distance protection.

Toshiba's numerical line current differential relay is based on well-proven principles while at the same time benefiting from our leading-edge technology and advanced manufacturing capabilities. In accordance with our philosophy of continuous product development, GRL100 has been regularly upgraded through the addition of new features, the latest of which is a back-up distance protection function. In a single unit GRL100 can now provide main protection through its high-speed, phase-segregated differential protection operating over various types of communication channel, while the new distance protection functions provide back-up tripping in case of a failure of the communication channel and for faults on adjacent circuits.



Toshiba supplied the world's first numerical line differential relay in 1980 and has remained at the forefront of developments in this field. The GPS-synchronised version of GRL100 was the first commercially available product of its type, suitable for application to SDH/SONET communication circuits that exhibit a differential propagation delay in their send and receive paths. By using the very precise GPS timing signal the sampling timing at all terminals of the transmission line can be synchronised within the order of microseconds. Furthermore, in the unlikely event that the GPS signal is lost a unique patented system of back-up modes ensure continued availability of the protection relay.



A brief description of the main features of GRL100 follows:

Protection Functions:

- Phase-segregated line differential protection
- Zero-sequence current differential protection for high-resistance earth faults
- Applicable to two-terminal or three-terminal lines
- Operating time typically 1 cycle
- Automatic propagation delay compensation
- Charging current compensation
- Overcurrent backup protection
- Stub protection
- Out-of-step protection
- *Optional GPS synchronisation*
- *Optional back-up distance protection*

Autoreclose Functions:

- Single-shot autoreclose
 - single-phase/three-phase/single-and three-phase autoreclose
 - multi-phase autoreclose for double circuit line
- Multi-shot autoreclose
 - three-phase autoreclose

Metering and recording functions:

- Metering
 - Power system voltages, local and remote currents, differential currents, power, frequency
- Recording
 - event record
 - fault record
 - disturbance record
- Fault location
 - Accuracy: ± 1 km (up to 100km) or $\pm 1\%$ (up to 399km) for two terminal line
 ± 2 km (up to 100km) or $\pm 2\%$ (up to 399km) for three terminal line

Programmable Logic Functions

- User-configurable logic functions for I/O configuration, alarms, indications and recording provide improved flexibility in scheme engineering.

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