



## PROTECTION RELAYS DL GTU103.2-S

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### Introduction:

Dedicated protection relays are used for monitoring each section of the power system (generators, transformers and transmission lines), to recognize a damaged system component for a specific fault event (under/over voltage, under/over frequency, over-current, earth-fault, reverse power, etc.), and to disconnect it quickly and reliably, protecting humans and the other healthy parts of the system while maintaining the power distribution.



## Experiments

### DL GTU103.2-S

#### Protection relays

- *Parameter configuration, fault simulation, relay response measurement and oscillograph recording for the following protections:*
  - Definite time overcurrent protection
  - Inverse time overcurrent protection
  - Earth-fault protection
  - Undervoltage protection
  - Overvoltage protection
  - Unbalanced load protection
  - Directional power protection



## Expansion:

Adding optional modules to the GTU 103.2-S configuration, the available list of experiments and system capabilities are expanded.

### DL GTU103A-S Generation protection

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• *Parameter configuration, fault simulation, relay response measurement and oscillograph recording for the following protections:*

- Overcurrent protection
- Over-voltage and under-voltage protection
- Over-frequency and under-frequency protection
- Unbalanced load protection
- Stator-earth fault protection
- Reverse power protection
- Generator differential protection

### DL GTU103B-S HV line protection

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• *Parameter configuration, fault simulation, relay response measurement and oscillograph recording for the following protections:*

- Definite time overcurrent protection
- Inverse time overcurrent protection
- Protection of radial feeder
- Earth-fault protection
- Undervoltage and overvoltage protection
- Unbalanced load protection
- Directional power protection
- Protection of parallel connected lines

### DL 2108T2 Distance protection

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• *Parameter configuration, fault simulation, relay response measurement and recording for the following protections:*

- Overcurrent protection
- Unbalanced load protection
- Distance protection

### DL GTU103C-S Transformer protection

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• *Parameter configuration, fault simulation, relay response measurement and oscillograph recording for the following protections:*

- Definite time overcurrent protection
- Inverse time overcurrent protection
- Restricted earth fault
- Transformer differential protection



## List of modules

### DL GTU103.2-S

DL 2102AL	Three-phase supply unit	1
DL 1080TT	Three-phase transformer	1
DL 1017R	Resistive load	1
DL 1017L	Inductive load	1
DL 2108T02	Power circuit breaker	1
DL 2108T02A	Power circuit breaker	1
DL 2109T29	Three-phase power meter	1
DL 2108T23	Feeder manager relay	1
DL HUBRS485F	Communication MODBUS	1
DL SCADA-256	SCADA Software with capacity limited to 256 tags	1
DL PCGRID	All-in-One Computer	1
DL 2600TTI	Three-phase isolation transformer	1
TLGTU103.X	Cables	1
DL 1196	Holder for leads	1
DL T12090_SK	120x90 working bench	1
DL A120-3M	Frame with three levels, basic version	1
DL SP-A120-LED	Upper base with LED strip, for DL A120-3M	1

## Expansion modules

### DL GTU103A-S

DL 10065N	Electric power measuring module	1
DL 1067S	Automatic voltage regulator	1
DL 2108T26	Brushless motor with controller	1
DL 2108T26BR	Braking resistance	1
DL 1026P4	Three phase synchronous machine 4 poles	1
DL 1013A	Universal base	1
DL 2109T1T	Synchronization indicator	1
DL 2108T24	Percentage biased generator differential relay	1
DL 2109T21	Single-phase current transformer	1
DL 2109T22	Three-phase current transformer	2
DL 2108T10	CT Load	1
DL T06090	60x90 working bench	2

### DL GTU103B-S

DL 7901TT	Overhead line model	2
DL 2108T13	Inverse time overcurrent relay	1
DL 2108T18	Earth-fault relay	1
DL T06090	60x90 working bench	1

### DL 2108T22

DL 2108T22	Distance protection relay	1
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# ELECTRICAL POWER ENGINEERING



## DL GTU103C-S

DL 2108T21	Differential transformer relay	1
DL 2109T22	Three-phase current transformer	2