

Ancillary functions

- Metering functions:
 - Phase currents (Ia, Ib, Ic), Zero sequence current (In1, In2)
 - Sequence currents (I1, I2), Ratio of sequence currents (I2/I1)
 - Phase voltages (Va, Vb, Vc), Phase-to-phase voltage (Vab, Vbc, Vca), Residual voltage (Vn)
 - Symmetrical component voltages (V1, V2, V0)
 - Power (P, Q, S), Power factor (PF)
 - Active power (W), Reactive power (VAR), Frequency (f)
 - Percentage of thermal capacity (THM%)
 - Maximum phase currents and voltages
 - Maximum power
 - Maximum and minimum frequency
- Event Recording
 - Up to 200 most recent events time-tagged to 1ms resolution.
- Fault recording
 - Up to 4 most recent faults with fault/phase reports prior to and during fault conditions.
- Disturbance recording
 - 8 analog and 32 binary signal records.
 - Max. 5 records each of five seconds duration.
- Communication
 - RS485: Modbus or IEC 60870-5-103
 - Ethernet (100Base-TX or 100Base-FX): IEC 61850

Dimensions and Weight

- 4U (177mm) height,
- 2/3 x 19" (297mm) width,
- 163mm depth
- 3.4kg (minimum configuration)
- 4.0kg (maximum configuration)

Ordering code GRE160 - 0 A - -

Type :	
Transformer protection	GRE160
Model (analog input) :	
2 x three-phase CT	1
2 x three-phase CT + 2 x zero-phase CT	2
2 x three-phase CT + 1 x single-phase VT	3
2 x three-phase CT + 2 x zero-phase CT + 1 x single-phase VT	4
2 x three-phase CT + 2 x zero-phase CT + 4 x single-phase VT	5
Model (Input and Output) :	
6xBIs, 4xBOs + Fail	0
12xBIs, 10xBOs + Fail	1
18xBIs, 16xBOs + Fail	2
Rating :	
CT: 1/5A, f: 50/60Hz, 110/250Vdc/110/240Vac	1
CT: 1/5A, f: 50/60Hz, 48/110Vdc	2
CT: 1/5A, f: 50/60Hz, 24/48Vdc	A
Standard and language :	
IEC (English)	0
Communication :	
RS485 1port (Modbus/IEC60870-5-103)	10
100BASE-TX 1port (IEC 61850)	A0
+ RS485 1port (Modbus/IEC 60870-5-103)	
100BASE-FX 1port(*) (IEC 61850)	C0
+ RS485 1port (Modbus/IEC 60870-5-103)	

(*) 100BASE-FX port is not available on 24/48Vdc power rating model.

GRE160

Transformer Protection



TOSHIBA

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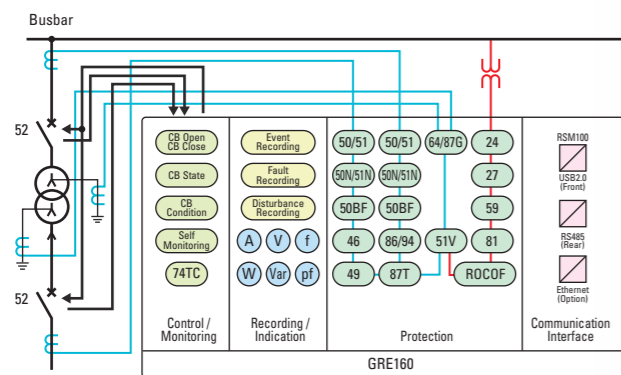
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GRE-Series – GRE160

Multi-Function Transformer Protection



GRE160 is a fully numerical multi-function transformer protection device designed for two-winding transformer protection applications, drawing upon proven technologies developed over more than 100 years, and providing a comprehensive range of protection and control functions.



Features

- Protection of two-winding transformer
- Current differential protection and comprehensive backup protection including overcurrent and earth fault protection, restricted earth fault protection, overexcitation protection etc.
- Feeder manager device with 2 x CB control function, 43R/L switch and comprehensive support functions
- Compact and cost-effective design
- Elementary, environmentally-friendly, easy to use and featuring enhanced product concepts

Functions

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> - Protection <ul style="list-style-type: none"> Current differential (87T) Inrush restraint (2f and 5f) Overexcitation (24) Undervoltage (27) NPS-OC (46) Thermal Overload (49) Phase Fault O/C (50/51P) Earth Fault O/C (50/51N) Voltage Controlled/Restrained OCI (51V) Circuit Breaker Fail (50BF) Phase O/V (59) Restricted Earth Fault (64 & 87G) Over/Under Frequency (81U/O) Frequency rate of change (df/dt) Lockout and trip relay (86/94) | <ul style="list-style-type: none"> - Control <ul style="list-style-type: none"> Local/Remote Control - Monitoring <ul style="list-style-type: none"> Trip circuit supervision (74TC) Self supervision CB State Monitoring Trip Counter Alarm ΣI^2 Alarm CB Operate Time Alarm - Communication <ul style="list-style-type: none"> USB port Remote communication (Modbus, IEC 60870-5-103 and IEC 61850) | <ul style="list-style-type: none"> - Others <ul style="list-style-type: none"> Two setting groups Menu-based HMI (16 x 8 characters) Configurable LED (8 fixed and 6 configurable) Programmable Logic Controller (PLC) |
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