

TP-PMRG

PROTECTION AND MEASUREMENT DEVICE FOR SECONDARY SUBSTATION

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TP-PMRG | PROTECTION AND CONTROL



FEATURES AND APPLICATIONS

Tesmec TP-PMRG is a protection and measurement relay for the automation of remote controlled distribution substations, operated in medium voltage.

Enables automatic fault location, isolation and mains power recovery. It integrates protection functions, measurement and telemetry, automatic paralleling, fault recording, analysis and monitoring of the quality of the electrical service. It communicates with other devices on the network according to the IEC 61850 protocol. It complies with the latest cyber-security standards.

The device is designed to be installed in a remote controlled MV substation, with SF6 or air insulated switch, line disconnector and air insulated disconnector. The metal casing is equipped with a hinged closure to allow access to the wiring and allows the product to be installed vertically. The TP-PMRG relay can be interfaced with 3 low-power current and voltage transducers (LPIT, according to IEC 61869), both active and passive, using shielded cables with RJ45 terminations: separate inputs are provided for transducers compliant with Enel Global DJ5400 and GSCT005. There are two more independent Ethernet ports: one in copper (RJ45) and one optical 100base-FX (LC).

It is equipped with:

- 2 control relays;
- 3 signaling relays;
- 6 optoisolated inputs.

Digital inputs and outputs can be configured via software and programmable with PLC logic. The device integrates the functions of the Web Server and has an isolated and configurable DC telemetry output (4-20 mA).

MAIN FEATURES

- Protection
- Control
- Measurement
- Communication (RTU)
- Diagnostic
- Automation (PLC IEC 61131)
- DFR (Data Fault Recorder)
- DER Management
- Compliant to IEC 61850
- Compliant to TATV GSCT005
- Compliant to TATV DJ5400
- Compliant to GSTP011 Rev.1

TECHNICAL FEATURES

TC-UPF20	Features	Value
General ratings	Capacitive sensor operating voltage MV	0,4 o 6÷24 kV ±50%
	Operating frequency	50 – 60 Hz ± 5%
	Frequency measurement accuracy (VF/ VS)	5 mHz
	Max three phase short-circuit current	16 kA
	Operating temperature	-25 °C ÷ +75 °C
	Supply voltage	24V dc (guaranteed from 15 V to 35 V). Protected against polarity inversion
Protection functions (ANSI / IEEE)	67/51 (overcurrent)	Independent time or inverse time (NIT/VIT/EIT/LIT) and 2ndH REST
	51N (earth overcurrent)	Independent time or inverse time (NIT/VIT/EIT/LIT) and 2ndH REST
	67N (phase/earth directional overcurrent)	Independent time or inverse time (NIT/VIT/EIT/LIT) and 2ndH REST
	32P (directional/reverse power)	Independent time
	27/27DC (undervoltage)	Independent time or inverse time
	50BF (breaker failure)	Independent time
	59/59N (maximum voltage)	Independent time or inverse time
	EAC 81 (frequency)	Independent time (max, min, derived and block functions)
	79 (auto reclosing CA)	Independent time
	25 (synchro-check device)	Synchronous parallel, asynchronous, synchronous + asynchronous
Voltage analog input (50 Hz / 60 Hz)	Transformation Ratio (linear sensor)	10 kV : 1 V [RMS] (primary 230V:1V [RMS])
	Transformation Ratio (capacitive sensor)	Calibrated via SW for 0,4 o 6÷24 kV ±50%
	Primary full-scale	72 kV/√3 [RMS]
	Bandwidth (-3dB)	2500 Hz (linear and capacitive)
	Linear input impedance	Ra=2 MOhm 0.5% (Cz<10 pF)
	Capacitive input impedance	Ca=220 nF 5% (Rz=2 MOhm)
	Nominal error (10kV)	≤ 0.2% of measured value
	Analog resolution	256 samples/period (16bit)
Current analog input (50 Hz / 60 Hz)	Transformation ratio (linear sensor)	1.0 kA : 300 mV / 1 V kA: 100mV / 1.0 kA: 31 mV [RMS]
	Transformation ratio (Rogowski sensor)	1.0 kA : 300mV / 1.0 kA: 100 mV / 1.0 kA : 31 mV [RMS]
	Primary full-scale	≤10ms
	Bandwidth (-3dB)	9 kA [RMS]
	Linear input impedance	DC : 2500 Hz (linear) e 0.5 Hz : 2000 Hz (Rogowski)
	Rogowski input impedance	Ra=20 kOhm 0.5% (Cz<10 pF)
	Nominal error (1.0 kA)	≤ 0.2% of measured value
	Analog resolution	256 samples/period (16bit)

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