Treetech



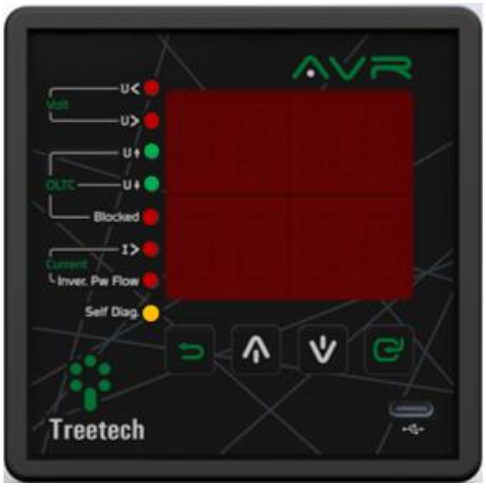
AVR

Automatic Voltage Regulator

PRODUCT CATALOG

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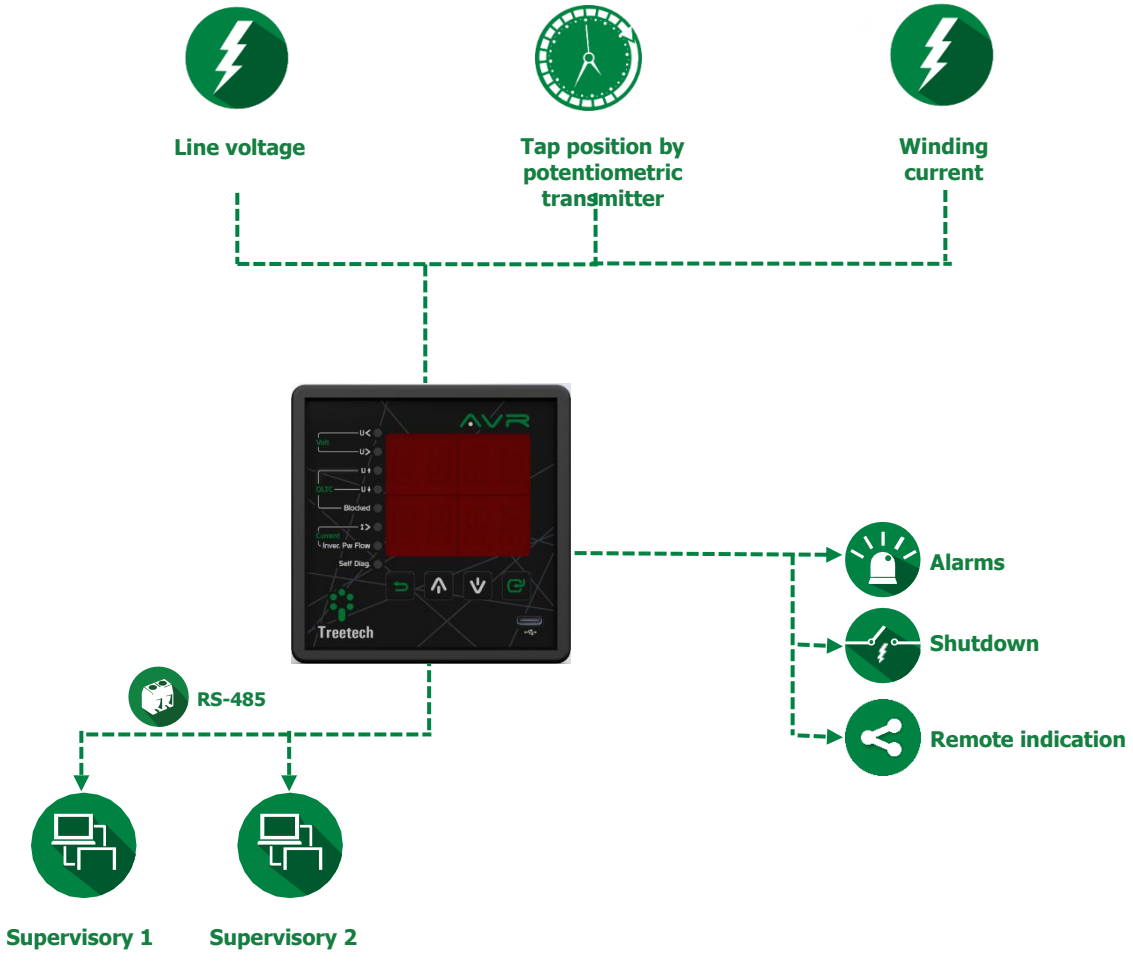
AUTOMATIC VOLTAGE REGULATOR



In a market that is increasingly demanding regarding the Quality of Electrical Energy, and with more and more strict rules for defining parameters and acceptable supply limits, there is a need for tools capable of adapting to this reality and allowing proper voltage regulation.

In this context, Treetech's new AVR Voltage Regulator Regulator offers a solution that goes beyond the traditional and well-known "90" relays, equipped with unprecedented resources to provide better control of load voltage limits, allowing the most demanding regulations in this sector to be met (such as, for example, ANEEL resolution 505).

SYSTEM TOPOLOGY



FEATURES AND FUNCTIONS

IED

- ✓ This IED (Intelligent Electronic Device) has a modern and compact design, being specifically developed for applications in transformers in substations and industrial or commercial installations.

ADJUSTABLE TC/TP PHASE DIFFERENCE

- ✓ Angle adjustments available from 0 to 330 degrees, enabling the use of any type of connection between PT and CT.

MULTIMETER

- ✓ Indication of voltages in the transformer and load, voltage deviation, current, active, reactive and apparent power, load percentage, power factor and frequency are some of the monitoring features offered by the equipment.

ALARMS AND SELF-DIAGNOSIS

- ✓ Issuance of alarms in case of abnormalities
- ✓ Self-diagnosis for internal fault detection and integration with other sensors

COMMUNICATION PROTOCOL

- ✓ RS-485 serial communication port for integration into supervisory or remote monitoring systems. Modbus® RTU or DNP3 open communication protocols.

INTERNAL CLOCK

- ✓ Adjustment maintained for at least 3 days in case of power failure, without the use of batteries – maintenance-free equipment.

VOLTAGE DROP COMPENSATION

- ✓ The platform performs this function in two ways: Resistance and Reactance (RX) adjustments or by the simplified voltage drop percentage method (Z compensation).

OLTC BLOCKING

- ✓ The on-load tap changer can be blocked in cases of overcurrent, overvoltage, undervoltage, tripped OLTC and/or power flow inversion.

OLTC COMMAND

- ✓ The user selects the on-load tap changer command mode between Local/Remote and Manual/Automatic.

MASS MEMORY (Default)

- ✓ Non-volatile memory for storing measurements and alarm events.

OLTC POSITION MEASUREMENT

One input for measuring the OLTC position via potentiometric transmitter, with cable resistance compensation and error detection.

Associated functions:

- ✓ Current output programming for remote tap indication
- ✓ Manual control of the local OLTC (front panel) and by communication via protocol
- ✓ Limitation of the OLTC excursion range (minimum and maximum taps allowed) and memorization of the minimum and maximum positions reached

OLTC blocking in case of carrying out operations not initiated by the AVR.

DIGITAL INPUTS

Four digital inputs to control OLTC command mode switching between Manual/Automatic and Local/Remote. They can also be used to command Tap Up/Down if the TAPP option is enabled.

OLTC MAINTENANCE ASSISTANT

This optional item expands the functionality of the AVR, e.g.:

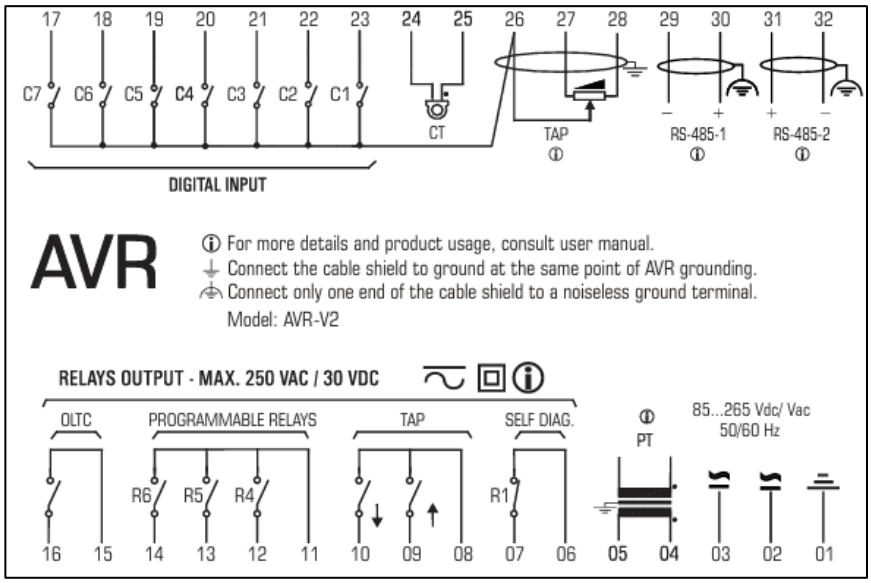
- ✓ OLTC operations counter, with maintenance warning by number of operations
- ✓ Integration of squared switched current, with maintenance warning due to high I^2 sum
- ✓ Estimated remaining time for maintenance
- ✓ Maintenance alarms are issued with a programmable advance

CHECKING SWITCHING SUCCESS ENABLED

This function allows the AVR to check the success of the switching by means of voltage changes after the regulation command (increase/decrease voltage). It works through algorithms that identify voltage levels corresponding to the sensitivity of the circuit, confirming whether the switching is active. If the tap changer is inactive, it generates regulation failure warnings.

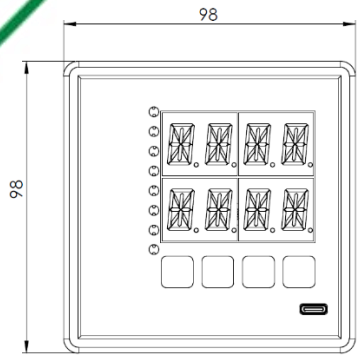
TECHNICAL DATA

HARDWARE	RANGE/DESCRIPTION
Supply voltage	85...265 Vac/Vdc
Frequency	50/60 Hz
Maximum consumption	<12 W
Operating temperature	-40...85 °C
Degree of protection	IP20
Fixing	Panel
MEASUREMENT INPUTS	
1 Voltage measurement (PT)	0...185 Vrms
1 Current reading (CT)	External clip-on CT 0...10 Aca rms
1 Potentiometric transmitter	2...49 taps
4 Digital inputs	Dry, potential-free contacts
OUTPUTS	
Relay output	6 NO relays (Normally Open) + 1 NC relay (Normally Closed)
Dielectric strength	300 Vrms at normally open 400 Vrms in normally closed
Maximum switching voltage	277 Vac / 125 Vdc normally open 400 Vac / 300 Vdc in normally closed
Maximum switching current	5.0 A @ 250 Vac; 1250 VA in normally open 6.0 / 5.0 A @ 250 Vac; 1250 / 1500 VA in normally closed
Resistive load	0.4 A @ 125 Vdc; 50 W in normally open 0.50 A @ 125 Vdc; 62.5 W in normally closed
COMMUNICATION INTERFACE	
Communication protocols	DNP3 Modbus® RTU
Communication ports	2 RS-485 (based on TIA-485-A standard) 1 USB Device type C
DIMENSION AND WEIGHT	**DESCRIPTION**
Dimension	98mm x 98 mm x 36 mm
Weight	230 grams

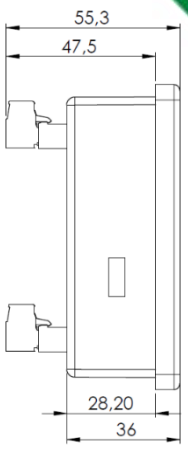


ELECTRIC DIAGRAM

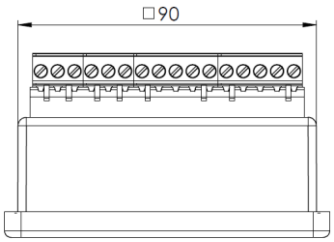
PRODUCT DIMENSIONAL



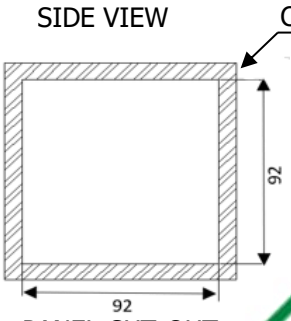
FRONT VIEW



SIDE VIEW



TOP VIEW



PANEL CUT-OUT

PRODUCT FRONT



ESSENTIAL ACCESSORIES



REGULATION CT

The use of an auxiliary external CT is required for the transformer voltage regulation system and for the IED.

RECOMMENDED ACCESSORIES

SIGMA ECM® MONITORING SOFTWARE

In addition to online monitoring of the temperature of your assets, with our monitoring system and our specialized team, it is possible to monitor the status of your assets beyond reading data.

Monitoring based on analysis of information collected by IEDs installed in your assets.

ORDERING SPECIFICATION

In the product purchase order it is necessary to specify:

- ✓ Product's name;
- ✓ Quantity;
- ✓ Model;
- ✓ Accessories.



Treetech

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See the list of our distributors at:

www.treetech.com.br/contato/representantes/