



Treotech



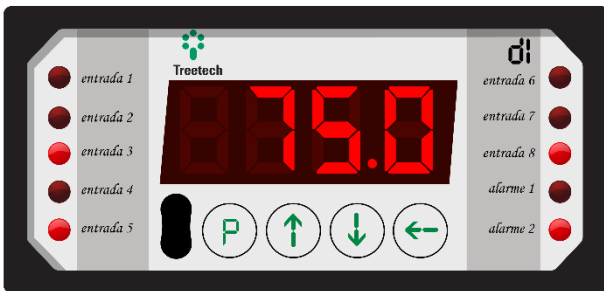
DI

Digital Indicator

**PRODUCT
CATALOG**

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DIGITAL INDICATOR - DI



The Indicador Digital - DI is a microprocessor-based electronic device designed for the remote monitoring of various parameters of power transformers and reactors. It enables the measurement of up to eight variables; for instance, the DI can display the insulating oil temperature, the temperatures of three windings, and oil moisture or water content for a single transformer, or the temperatures of phases A, B, and C—plus a spare—

for a bank of single-phase transformers.

The 8 indications are displayed via LEDs arranged on the front of the DI, signaling the variable currently being indicated.

The input variables are individually configured by the user with measurement scale start and end points. The alarm limit for each variable is programmable at two levels; if any of the monitored variables exceeds its limit, the corresponding LED flashes and a contact is activated for use in an alarm system.

The DI features an analog output for remote indication that reflects the user-configured variable; it also includes RS-485 serial communication, using Modbus® RTU or DNP3 protocols (optional), which allows for remote reading of variables and modification of alarm limits.

FEATURES AND FUNCTIONS



IED

- ✓ This IED (Intelligent Electronic Device) features a modern, compact design and is specifically engineered for transformer applications in substations and industrial or commercial facilities.



INTERNAL CLOCK

- ✓ Internal real-time clock (date and time) and non-volatile memory for storing measurements.



ALARM AND SELF-DIAGNOSIS

- ✓ Output relays for two alarm level indications (NO or NC contact – user-configurable) and internal fault (NC contact);
- ✓ Self-diagnostics for internal fault detection. Complete absence of mechanical parts for parameterization and calibration.



COMMUNICATION PROTOCOL

- ✓ RS-485 serial communication port for integration with supervisory or remote monitoring systems. Open communication protocols: Modbus RTU or DNP3.0.



CURRENT LOOP INPUT

- ✓ Current loop input: 0...1, -1...1, 0...5, -5...5, 0...10, -10...10, 0...20, -20...20, or 4...20 mA; user-configurable.



ANALOG OUTPUT

- ✓ Analog output for remote indication;
- ✓ Programmable output range: 0...1, -1...1, 0...5, -5...5, 0...10, -10...10, 0...20, -20...20, or 4...20 mA.

OPTIONAL FUNCTION

DNP3 - DNP3 Protocol

User-selectable communication protocol between Modbus® RTU and DNP3.

TECHNICAL DATA

INFORMATION	RANGE/DESCRIPTION
Supply voltage	38 to 265 VDC/VAC, 50/60 Hz
Maximum consumption	< 5 W
Operating temperature	-40 to 85 °C
Protection rating	IP 20
Mounting	Panel-mount
Connections	0.3 to 2.5 mm ² , 22 to 12 AWG
INPUTS	
Quantity and type	8 analog current inputs
Range (configurable during parameterization)	0 to 1 mA; 0 to 5 mA; 0 to 10 mA; 0 to 20 mA; 4 to 20 mA; -1 to 1 mA; -5 to 5 mA; -10 to 10 mA; -20 to 20 mA.
Maximum error	0.5% of full scale
Impedance	65 Ω ± 1%
Start and end of scale adjustment range	-999 to 9999 (with decimal point adjustment)
DIGITAL OUTPUTS	
Quantity and type	2 changeover contacts and one NC contact
Maximum switching power	70 W (DC) / 220 VA (AC)
Maximum switching voltage	250 VDC / 250 VAC
Maximum continuous current	5 A
ANALOG OUTPUTS	
Quantity and type	1 analog current output
Range (configurable during parameterization) and maximum load	0 to 1 mA / 10 kΩ; 0 to 5 mA / 2 kΩ; 0 to 10 mA / 1 kΩ; 0 to 20 mA / 500 Ω; 4 to 20 mA / 500 Ω;

	-1 to 1 mA / 10 k Ω ; -5 to 5 mA / 2 k Ω ; -10 to 10 mA / 1 k Ω ; -20 to 20 mA / 500 Ω .
Maximum error	0.5% of full scale
COMMUNICATION	
Quantity and type	1 RS-485 port
Protocols	Modbus RTU (standard) or DNP3.0 Level 1 (optional)

TYPE TESTS

Immunity to surges (IEC60255-22-5)

Phase-to-neutral surges	1 kV, 5 per polarity (+/-)
Phase-to-earth and neutral-to-earth surges	2 kV, 5 per polarity (+/-)

Immunity to electrical transient (IEC 60255-22-1) e (IEEE C37.90.1)

1st cycle peak value	2.5 kV
Frequency	1.1 MHz
Duration and repetition rate	2 s, 400 bursts/sec.
Decay to 50%	5 cycles

Voltage impulse (IEC 60255-5)

Waveform	1.2 / 50 sec
Amplitude and energy	5 kV
Number of pulses	3 negative and 3 positive, 5 s interval

Applied voltage (IEC 60255-5)

Power-frequency withstand voltage	2 kV 60 Hz 1 min to ground
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Immunity to radiated electromagnetic fields (IEC 61000-4-3/IEC 60255-22-3)

Frequency	26 to 2000 MHz
Field strength	10 V/m

Immunity to conducted electromagnetic disturbances (IEC 60255-22-6)

Frequency	0.15 to 80 MHz
Field strength	10 V/m

Immunity to electrostatic discharge (IEC 60255-22-2) and (IEEE C37.90.3)

Air mode	8 kV, ten discharges per polarity
Contact mode	6 kV, ten discharges per polarity

Immunity to fast electrical transients (IEC 60255-22-4) and (IEEE C37.90.1)

Power supply, input, and output test	4 kV
Serial communication test	2 kV

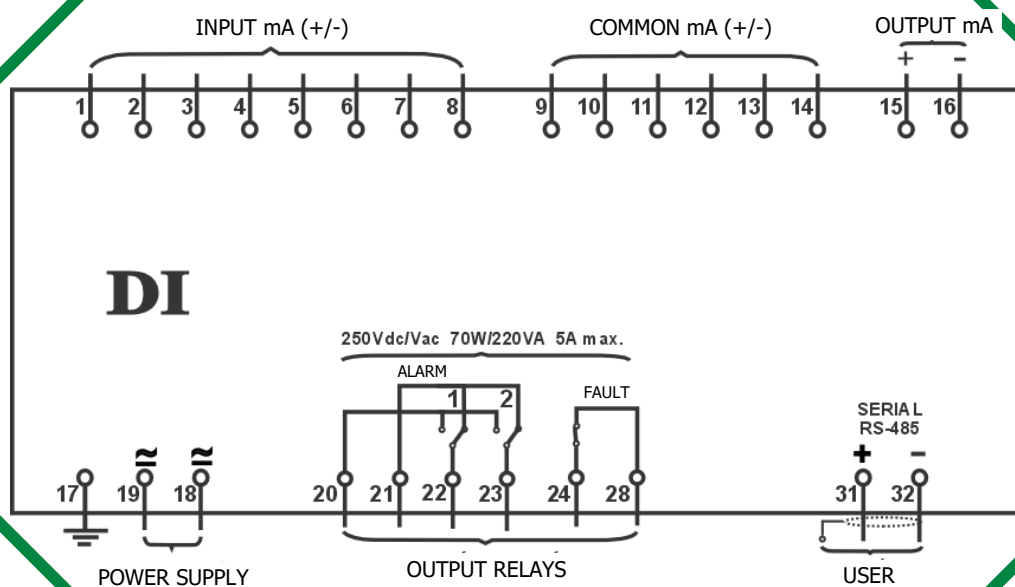
Climatic test (IEC 60068-2-14)

Temperature range	-40 to +85°C
Total test time	120 hours

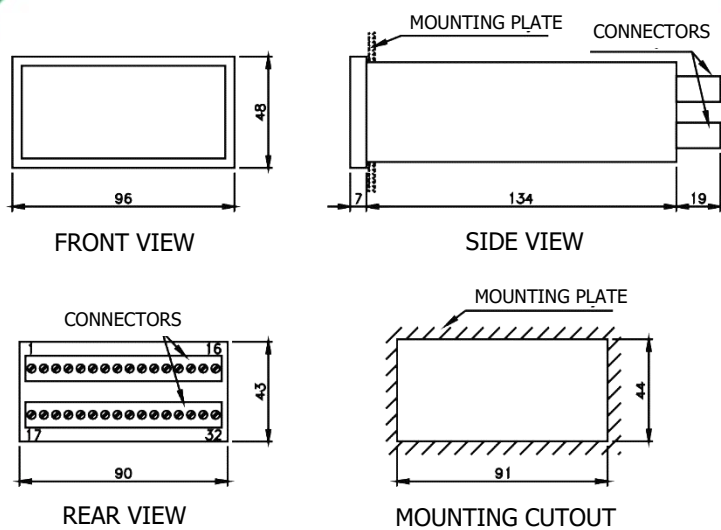
Vibration response (IEC 255-21-1)

Application mode	3 axes (X, Y, and Z), sinusoidal
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Amplitude	0.075 mm from 10 to 58 Hz
Intensity	1 G from 58 to 150 Hz
Duration	8 min/axis
Vibration resistance (IEC 255-21-1)	
Application mode	3 axes (X, Y, and Z), sinusoidal
Frequency	10 to 150 Hz
Intensity	2G
Duration	160 min/axis



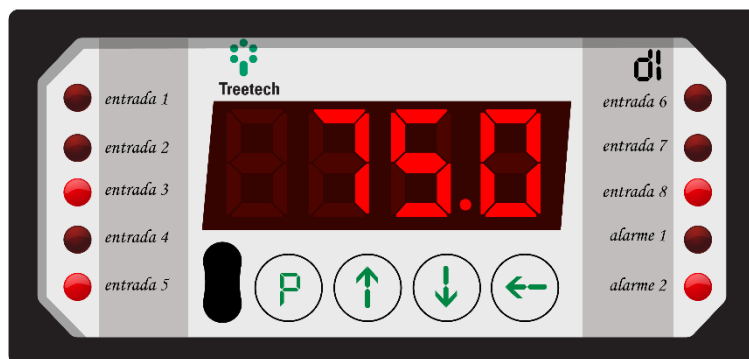
ELECTRICAL DIAGRAM



ALL DIMENSIONS IN mm

PRODUCT
DIMENSIONS

PRODUCT
FRONT VIEW



ORDER SPECIFICATION

When ordering the product, it is necessary to specify:

- ✓ Product name;
- ✓ Quantity;
- ✓ Option:
 - DNP3 – DNP3 communication protocol.





Treetech

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Check the list of our distributors at:

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