

# CATALOG

Thermal Protection Relay – EP3



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## INTRODUCTION

Thermal Protection Relay **EP3** was developed to supervise up to 4 (four) temperature channels simultaneously to protect and monitor dry transformers, Motors, Bearings, Machines, and industrial process as established by ANSI table. The **EP3** is reliable and a highly precision instrument, it commands the ventilation (ON/OFF). Alarms and TRIP (Shutdown), with a programmable timer option.

The Thermal Protection Relay **EP3** was built obeying to strict quality patterns and uses last generation high quality electronic components (SMD), its hardware was designed to endure severe work conditions, it can be installed direct on transformers panel on substation courtyard, Maritime's platforms, and chemical plants. Attend to the highest levels of supportability and reliability according to IEC, DIN, IEE and ABNT.

As signal input 4 PT-100 temperature sensors (EN60751-DIN 43760) up to 3 active and configurable analog output 15 Vdc to 2 universal wires with 0 to 1mA, 0 to 5mA, 0 to 10mA, 0 to 20mA and 4 to 20 mA as reading range option that can be used to reflect the higher temperature read At the SCAN function, when the monitor has just 1 analog output simultaneously.

The Thermal Protection Relay **EP3** also has a RS-485 analog output with DNP3 (Level 1) and Modbus RTU digital output that allows access to all parameters including real-time remote commands of the electric drives, it has 3 independent temperature setpoints to each sensor and 4 (four) isolated activation Relays (NOC) independent and potential free to failure indication (watchdog).

The display presentation mode is totally configurable by the user, it can keep the current highest temperature fixed on display, and any temperature that the operator selects. Or, through the SCAN function that presents a complete sweep of all measure channels continuously. Through Frontal indicatives LED's and through the data communication doors is possible to identify which of the channel caused the Alarm, TRIP (Shutdown) or the ventilation activation, all this function and parametrization are easy configured directly on the equipment frontal or by **UseEasy™** software for version that has USP port or through the RS-485 communication door.

Thermal Protection Relay **EP3** is built in an aluminum enclosure of high mechanical resistance with 98x98x37mm, according with DIN IEC 61554 for panel fixation patterns.

**MAIN CHARACTERISTICS**

- Compact Equipment with 37mm depth;
- Numerical Display of high red brightness with 3 and 4 digits;
- 0,5% (FS) precision;
- Temperature measurement Range of 0°C to 200°C or -50°C to 250°C;
- Compensated inputs for PT-100 2 or 3 wires sensors (EN 60751 - DIN 43760);
- 24-275 Vdc / Vac Power Supply;
- 2.0 USB Frontal Input to configuration through **UseEasy™** software;
- Digital output (ANSI/TIA/EIA-485-A) RS-485 with Modbus RTU Protocol and/or DNP3 Level 1;
- Auto Baud Rate 1,200 to 57,600 bps (It automatically detects the serial network speed);
- Analog Outputs (15 Vdc Outputs) of 0 to 1mA, 0 to 5mA, 0 to 10mA, 0 to 20mA and 4 to 20mA configurable by the user;
- Ventilation Activation Directly on the equipment frontal. It can be done automatically or by communication protocol command.
- Ventilation Exercise with daily operation programming (5 minutes per day);
- It memorizes the maximum temperature reached by each Sensor;
- 01 Relay (NOC) with 10 ampere capacity for temperature Alarm;
- 01 Relay (NOC) with 10 amperes capacity for temperature TRIP (Shutdown) with programmable operation timer;
- 01 Relay (NOC) with 10 amperes capacity for Failure Indication (watchdog);
- Easy to use and to program;
- 2 Years Warrant;

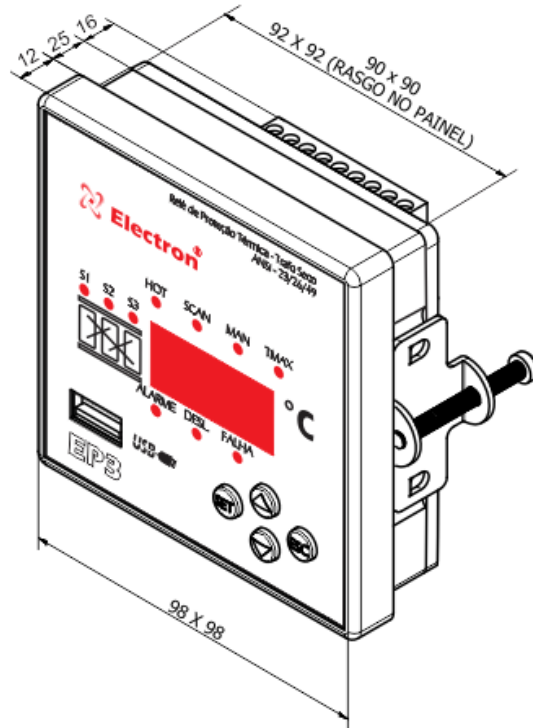
## TECHNICAL DATA

<b>Thermal Protection Relay EP3</b>	
Operation Voltage	24 to 275 Vdc/Vac 50/60 Hz
Temperature Operation	-40°C to + 85°C / -10°C to +70°C
Energy Consumption	< 15 W
Temperature Measurement Input	Until 3 Sensors - PT100 Ohm to 0°C, 2 and 3 wires ( <b>EN 60751 - DIN 43760</b> )
Measurement Range	0°C a 200°C or -50°C to 250°C
Active Analog Output 15Vdc and Maximum Load.	24 to 275 Vdc/Vac 50/60 Hz
	0 ... 5mA - 1600 Ohms
	0 ... 10mA - 800 Ohms
	0 ... 20mA - 400 Ohms
Measurement Input Maximum Error	4 ... 20mA - 400 Ohms
Measurement Input Maximum Error	Measurement Input Maximum Error
Analog output maximum	Analog output maximum
Output Contact	Output Contact
Maximum Switching Power	Maximum Switching Power
Maximum Switching	250 Vac/125Vdc
Maximum Driving Current	10 Amperes
Digital Communication Port	USB 2.0 – Type A Male Connector
Serial Communication Port	RS 485 – 2 wires (ANSI/TIA/EIA-485A)
Communication Protocol	Modbus RTU or DNP 3.0 - Level 1
Auto Baud Rate (It automatically detects the network communication Speed)	1.200 to 57.600bps
Enclosure DIN IEC 61554	98 x 98 x 37 mm ou 98 x 98 x 57 mm
Fixation	Panel Door with steel clip
Protection	IP40 (Frontal), IP 20 (Connectors)

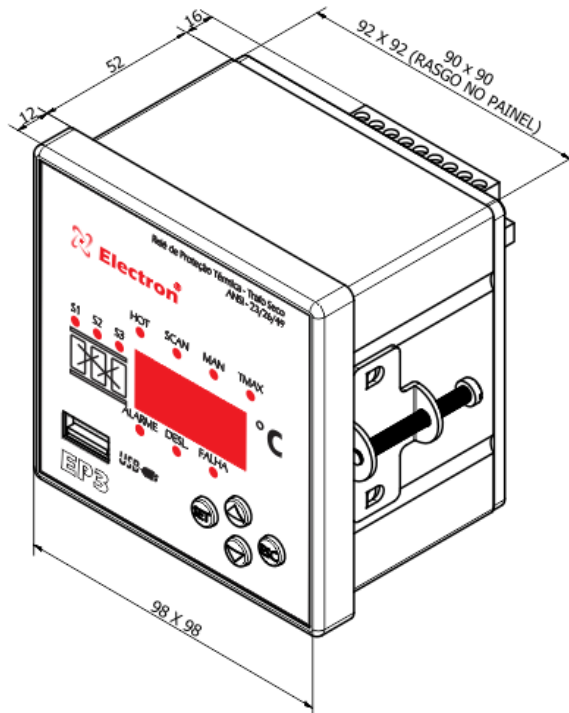
## TYPE TESTS ATTENDED

- Applied Voltage (**IEC 60255-5**): 2kV / 60Hz / 1 min. (Against earth);
- Voltage Impulse (**IEC 60255-5**): 1,2/50 µsec. / 5kV / 3 neg. and 3 pos. / 5 seconds. Interval;
- Electrostatic Discharge (**IEC 60255-22-2**): air mode = 8KV / Counted mode = 6 KV;
- Immunity to radiated electromagnetic disturbance (**IEC61000-4-3**): 80 to 1000 MHz / 10V/m;
- Fast electrical Transient's immunity (**IEC60255-22-4**): Power Supply/Input/Output = 4KV/common 2Kv;
- Electrical Surges immunity (**IEC60255-22-5**): Phase/neutral 1KV, 5 by Polar (±) - phase-earth/neutral-earth 2KV, 5 by polar (±);
- Driven Electromagnetic Surges Immunity (**IEC61000-4-6**): 0,15 to 80 MHz / 10V/m;
- Climatic Test (**IEC60068-21-14**): - 40°C + 85°C / 72 hours;
- Vibration Endurance (**IEC60255-21-1**): 3 axis / 10 a 150Hz / 2G / 160min/axis;
- Vibration Response (**IEC60255-21-1**): 3 axis / 0,075mm-10 to 58 Hz / 1G of 58 to 150 Hz / 8min/axis;

**DIMENSIONS**

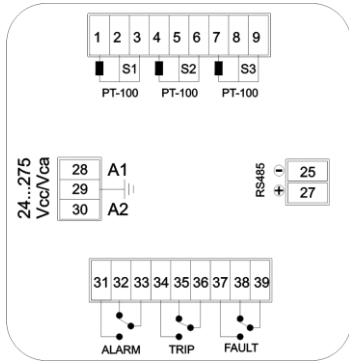


*Fig. 1 – Slim Model with USB Dimensions*

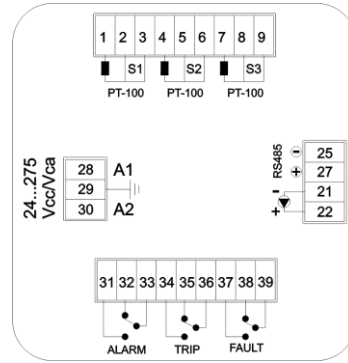


*Fig. 2 - DIMENSIONS para equipamentos modelo com USB*

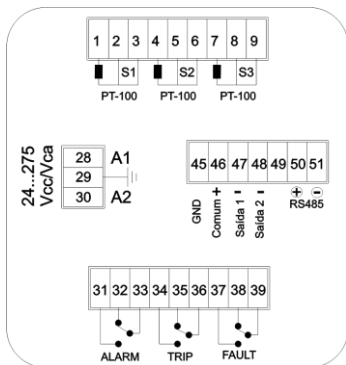
**EP3 DIAGRAM CONNECTIONS**



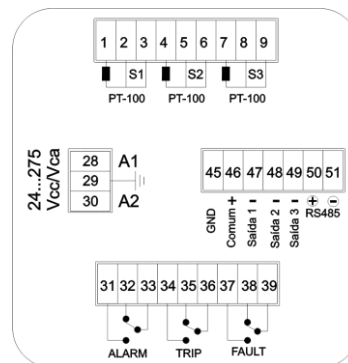
*Fig. 3 – EP3 with 1 serial output  
 Order - 3110001*



*Fig. 4 – EP3 with 1 serial output and 1 analog output  
 Order - 3110011*

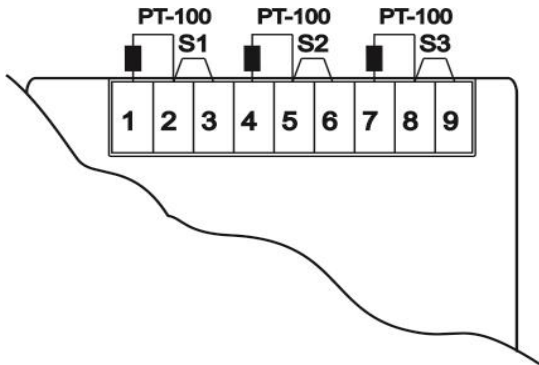


*Fig. 5 – EP3 with 1 serial output and 2 analog output  
 Order - 3110021*

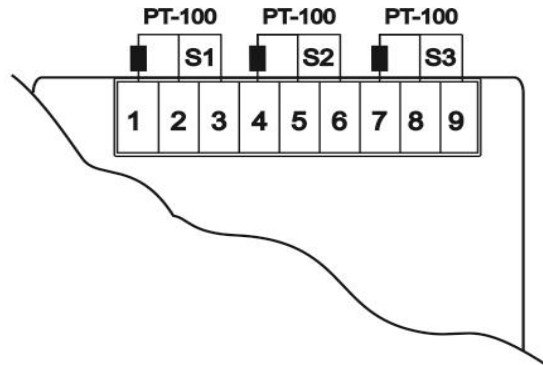


*Fig. 6 – EP3 with 1 serial output and 3 analog output  
 Order - 3110031*

**SENSOR INPUTS – SENSORS CIRCUITS (EM 60751 – DIN 43760)**

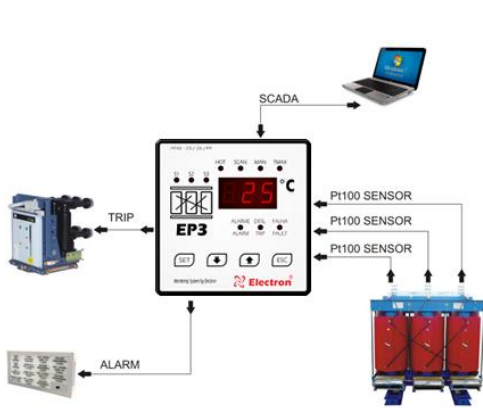


*Fig. 7 – 2 wires connection diagram*

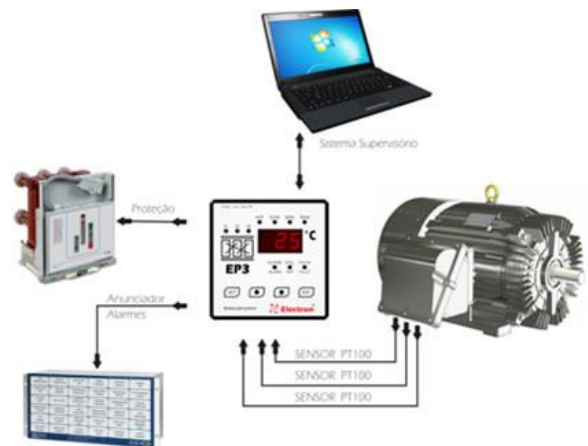


*Fig. 8 – 3 wires connection diagram*

**EXAMPLES**



*Fig. 9 – EP3 monitoring dry transformer with serial output*



*Fig. 10 – EP3 monitoring dry transformer with serial output*



*Fig. 11 – UseEasy™ Configuration Software, Totally Free.*

**INSTALLATION ACESSORIES**



*Fig. 13 – EP3 Box Mounted for Hazardous Area - EX*



*Fig. 14 – Outdoor Box IP54*



*Fig. 15 – Fixing bracket for panel bottom.*





Fig. 16 – Temperature Sensors PT-100 – To Dry Transformer, motor and bearings up to 30 KV

### TECHNOLOGY - DISPLAY



Fig. 17 – Model without USB

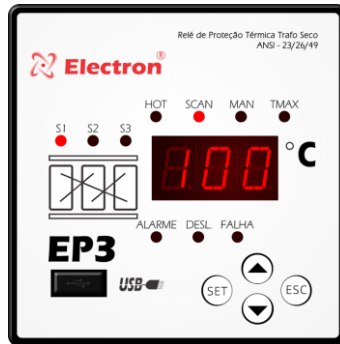


Fig. 18 – USB with USB



Fig. 19 – 3 (three) Model digits with USB

### SPECIFICATION ORDER

