



EP4 thermal protection relay

Manual

INDEX

INDEX	1
INTRODUCTION	2
MAIN FEATURES	3
TECHNICAL DATA	3
TYPE TESTS ATTENDED	4
DIMENSIONS	5
EP4 CONNECTION DIAGRAMS	6
SENSOR INPUT - SENSOR CIRCUIT (EM 60751 – DIN 43760)	7
OPERATION CHART	8
PREVENTIVE MAINTENANCE	9
EP4 INFORMATION LABELS	10
EXAMPLES	11
INSTALLATION ACCESSORIES	12
GETTING TO Know EP4	14
QUERY MENU FLOWCHART	15
QUERY MENU	15
CONFIGURATION FLOWCHART	16
CONFIGURATION MENU	17
FAN DRIVE FLOWCHART	22
FAN DRIVE MENU	22
DEFECT SOLUTION	22
IMPORTANT RECOMMENDATIONS	23
WARRANTY TERM	23
<i>Disclaimer of Warranty</i>	23
<i>Loss of Warranty</i>	23
SPECIFICATION FOR ORDER	24
SUPPORT AND CONTACT	24
DECLARATION OF CONFORMITY	25
REVISION CONTROL	26

INTRODUCTION

The EP4 Thermal Protection Relay is designed to supervise up to four (4) temperature channels simultaneously to protect and monitor dry transformers, motors, bearings, machinery and industrial processes, as established by the ANSI table. The EP4 is reliable and a high-precision instrument, commands ventilation (ON / OFF). Alarms and TRIP, with a programmable timer option.

The EP4 Thermal Protection Relay was built obeying strict quality standards and uses high-quality electronic components (SMD) of the latest generation, its hardware has been designed to withstand severe working conditions, it can be installed directly on the transformer panel in the substation yard, Marine platforms and chemical plants. Meet the highest levels of support and reliability according to IEC, DIN, IEE and ABNT.

As signal input, 4 PT-100 temperature sensors (EN60751-DIN 43760) up to 1 active and configurable analog output from 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 a reading range option that can be used to reflect the highest temperature read in the SCAN function, when the monitor has only 1 analog output simultaneously.

The EP4 Thermal Protection Relay also has an RS-485 analog output with digital output DNP3 (Level 1) and Modbus RTU that allows access to all parameters, including real-time remote commands of the electric drives, has 3 independent temperature set points for each sensor and 4 (four) independent isolated activation relays (NOC) and indication of fault-free potential (watchdog).

The display mode of the screen is fully configurable by the user, can keep the current highest temperature fixed on the screen and any temperature that the operator selects. Or, via the SCAN function, which presents a complete scan of all measurement channels continuously. Through the front indicative LEDs and through the data communication ports it is possible to identify which channel caused the alarm, TRIP (shutdown) or the activation of ventilation, all these functions and parameterizations are easily configured directly on the front of the equipment or by the UseEasy™ software for version with USP port or through the RS-485 communication port.

The EP4 Thermal Protection Relay is built in a 98x98x37mm high mechanical strength aluminum enclosure, as per DIN IEC 61554 for panel fastening standards.

MAIN FEATURES

- Compact equipment with a depth of 37mm;
- High red brightness numerical display with 3 and 4 digits;
- 0.5% accuracy (FS);
- Temperature measuring range from 0°C to 200°C or -50°C to 250°C;
- Compensated inputs for PT-100 sensors of 2 or 3 wires (EN 60751 - DIN 43760);
- Power supply 24-275 Vdc / Vac;
- Digital output (ANSI / TIA / EIA-485-A) RS-485 with Modbus RTU protocol and DNP3 level 1;
- Automatic transmission rate from 1,200 to 57,600 bps (automatically detects serial network speed);
- Analog outputs (15 Vdc) from 0 to 1mA, 0 to 5mA, 0 to 10mA, 0 to 20mA and 4 to 20mA configurable by the user;
- Activation of ventilation directly on the front of the equipment. This can be done automatically or by communication protocol.
- Ventilation exercise with daily operation schedule (5 minutes per day);
- Memorizes the maximum temperature reached by each sensor;
- 01 relay (NOC) with capacity of 10 amps for temperature alarm;
- 01 (NOC) with capacity of 10 amps for FAN (cooling) with programmable operation timer;
- 01 relay (NOC) with capacity of 10 amps for TRIP temperature (shutdown) with programmable operating timer;
- 01 relay (NOC) with a capacity of 10 amps for failure indication (watchdog);
- Easy to use and program;
- 2 years warranty;

TECHNICAL DATA

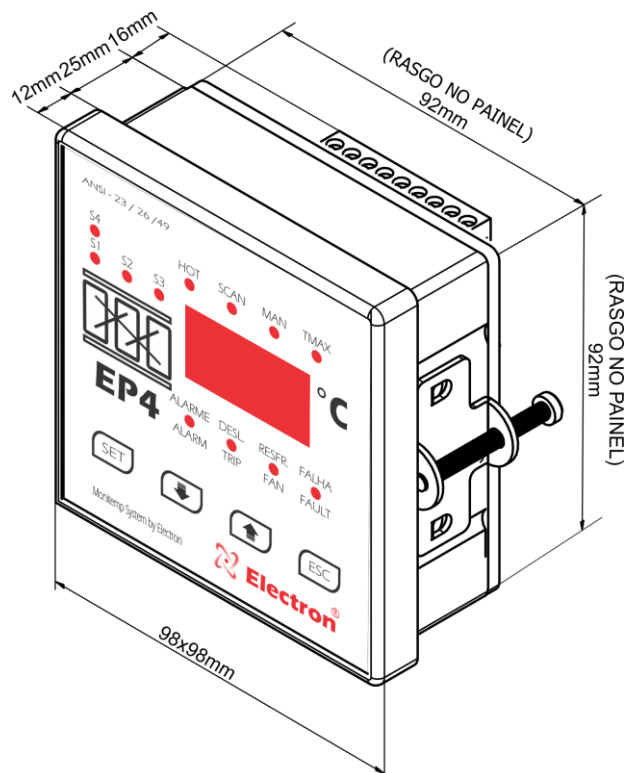
THERMAL RELAY	
Operating Voltage	24 to 275 Vdc/Vac 50/60 Hz
Operating Temperature	-40°C to + 85°C
Power Consumption	< 15 W
Temperature Measurement Input	Up to 4 Sensors - PT100 Ohm at 0°C, 2 and 3 wires (EN 60751 - DIN 43760)
Measuring Range	0°C to 200°C or -50°C to 250°C
Active Analog Output 15Vdc and Maximum Load.	0 ... 1mA - 8000 Ohms
	0 ... 5mA - 1600 Ohms
	0 ... 10mA - 800 Ohms
	0 ... 20mA - 400 Ohms
	4 ... 20mA - 400 Ohms
Maximum Measurement input error	0.25% end of scale
Maximum analog output error	0.25% end of scale
Outgoing contacts	4 (NAF) – Potential Free
Maximum Switching Power	70 W / 250 VA
Maximum Switching Voltage	250 Vac/125Vdc

Maximum Driving Current	10 Amps
Serial Communication Port	RS 485 – 2 wires (ANSI/TIA/EIA-485A)
Communication Protocol	Modbus RTU or DNP 3.0-L1
Auto Baud Rate (Automatic Network Speed Detection)	1,200 to 57,600bps
Box DIN IEC 61554	98 x 98 x 37 mm or 98 x 98 x 57 mm
Fixation	Panel door with steel latch
Protection	IP40 (Front), IP 20 (Connectors)

Table 1 – Technical data of the EP4 thermal protection relay.

TYPE TESTS ATTENDED

- Applied Voltage (**IEC 60255-5**): 2kV / 60Hz / 1 min. (against land);
- Voltage Impulse (**IEC 60255-5**): 1.2/50 μ sec. / 5kV / 3 neg. and 3 pos. / 5 secs. Interval;
- Electrostatic Discharges (**IEC 60255-22-2**): Air mode = 8KV / Counted mode = 6 KV;
- Immunity to irradiated electromagnetic disturbance (**IEC61000-4-3**): 80 to 1000 MHz / 10V/m;
- Immunity to Fast Electrical Transients (**IEC60255-22-4**): Alim/Entr./Outputs=4KV/common 2Kv;
- Surge Immunity (**IEC60255-22-5**): phase/neutral 1KV, 5 per polar (\pm) - phase-earth/neutral-earth 2KV, 5 per polar (\pm);
- Immunity to Conducted Electromagnetic Disturbances (**IEC61000-4-6**): 0.15 to 80 MHz / 10V/m;
- Climate Test (**IEC60068-21-14**): - 40°C + 85°C / 72 hours;
- Vibration Resistance (**IEC60255-21-1**): 3 axes / 10 to 150Hz / 2G / 160min/axis;
- Vibration Response (**IEC60255-21-1**): 3 axes / 0.075mm-10 to 58 Hz / 1G from 58 to 150 Hz / 8min/axis;

DIMENSIONS

Link de página para download do arquivo
de desenho em DWG:
<https://electron.com.br/site/produtos/ep4>

Figure 1 - EP4 Dimensions Illustration

EP4 CONNECTION DIAGRAMS

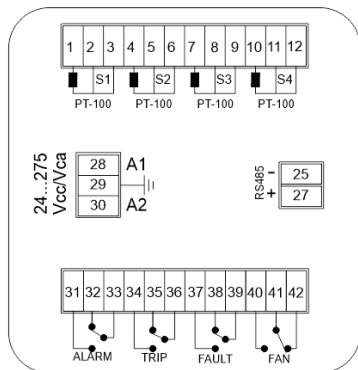


Figura 2 - EP4 Com 1 saída serial

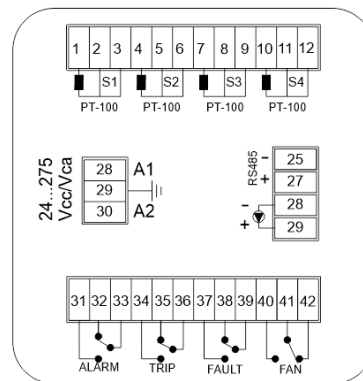


Figura 3 - EP4 com 1 saída serial e 1 saída de corrente

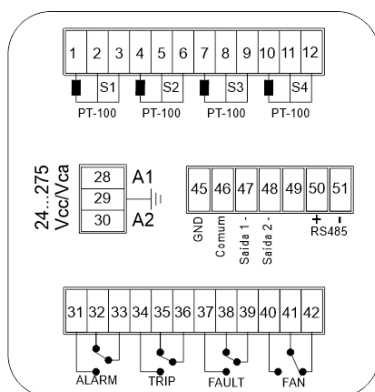


Figura 4 - EP4 com 1 saída serial e 2 saídas de corrente

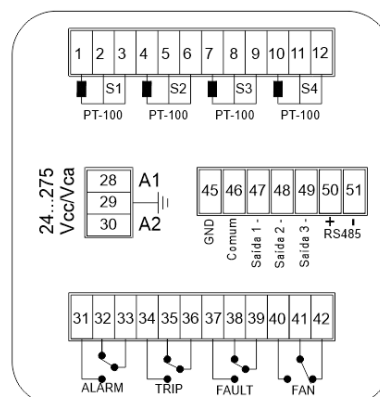


Figura 5 - EP4 com 1 saída serial e 3 saídas de corrente

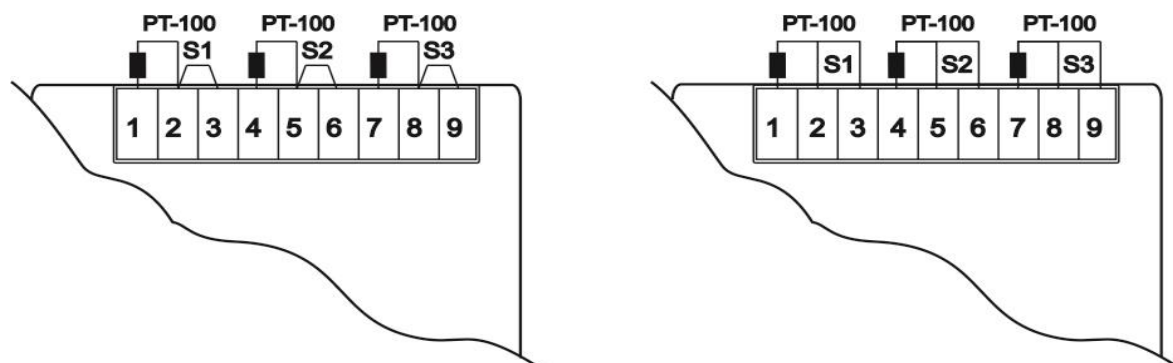
SENSOR INPUT - SENSOR CIRCUIT (EM 60751 – DIN 43760)

Figure 6 – 2-wire connection diagram and 3-wire connection diagram

Link da página do sensor de temperatura PT100 STFE da Electron:
<https://electron.com.br/site/produtos/rtd-pt100-2/>

OPERATION CHART

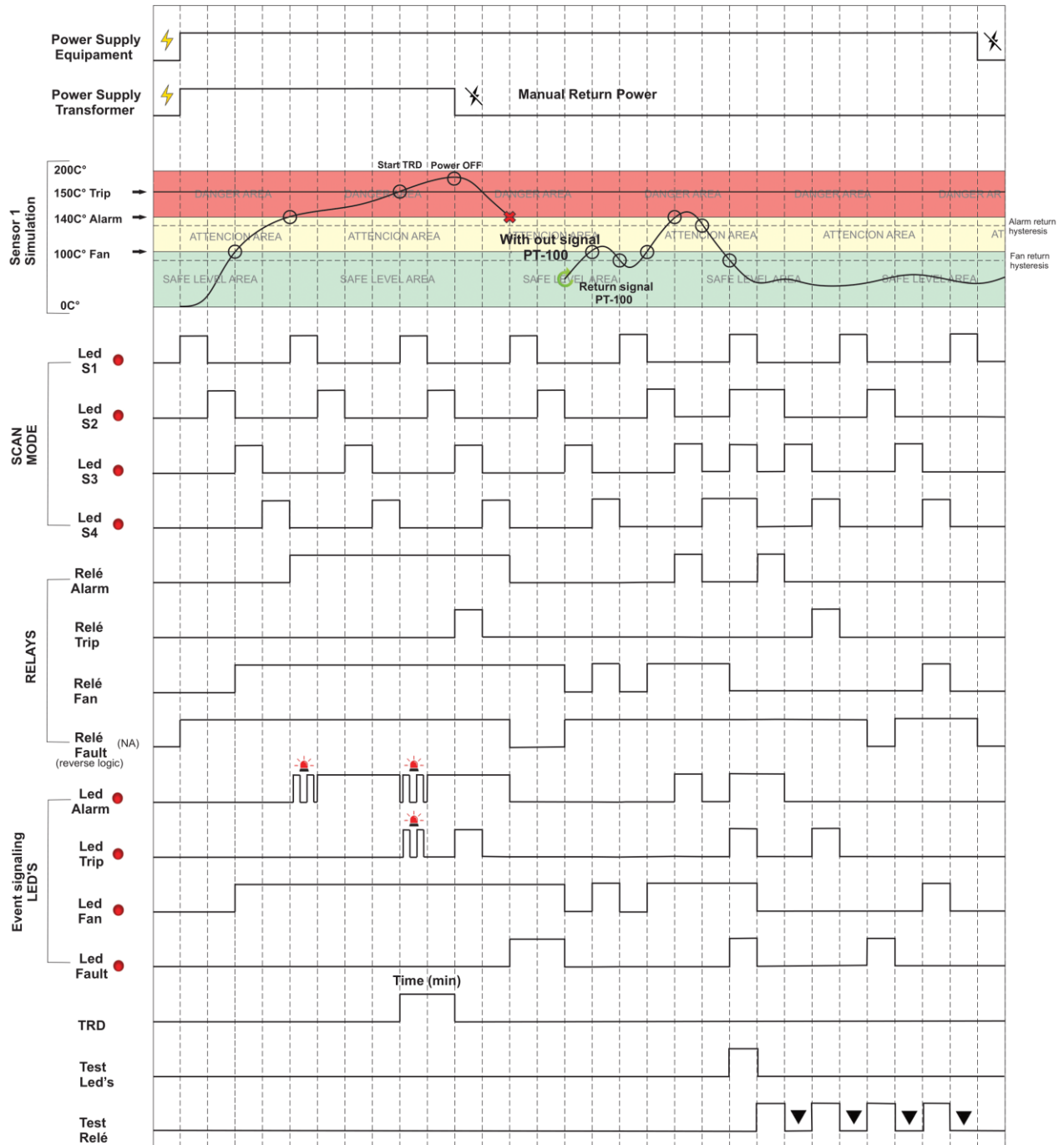


Figure 7 – Operation chart

PREVENTIVE MAINTENANCE

PREVENTIVE AND CORRECTIVE MAINTENANCE							
Items to be checked preemptively			Scan Frequency				Corrective action
SHARE	Verification Elements	ACTIVITIES	Every Month	Every 3 Months	Every 6 Months	Every 1 Year	When Needed
VERIFICATION	Fastening and fitting clip on the rail	Attachment to panel door or panel bottom		X			Retightening, Fitting, terminal exchange or screw exchange
	Terminals and Connector Comb	Fastening and fitting into the equipment		X			
		Tightening of the screws in the attachment of the conductors		X			
	Sensors	Integrity / Positioning / Fastening			X		Replacement, Repositioning and/or Fixing of Sensors
	Sensor well in Oil Transformers	Oil level in the well			X		Filling with oil up to the indicated level
TESTS & MEASUREMENTS	Relays and Digital Outputs	Individual drive test			X		Forward to technical assistance of Electron do Brasil
	Led's and Displays	Test drive Led's and display segments			X		
	Navigation buttons	Navigation test of navigation buttons			X		
	Sensor Input	Measure sensor inputs using a pattern				X	
	Input Supply Voltage of the equipment	Measure Power Input Voltage			X		Replace voltage input values according to equipment model
	RS-485 communication outputs	Communication and command testing in the supervisory system			X		Forward to technical assistance of Electron do Brasil
	Milliampere Current Signal Inputs	Measure, compare, and measure input signal in passive and/or active mode			X		
	Milliampere Current Signal Outputs	Measure, compare, and measure input signal in passive and/or active mode			X		
CLEANING	Terminals and Comb of connectors and connection box	Debris, Impurities and Moisture	X				Cleaning with dry cloth, compressed air and vacuum cleaner
	Aluminum equipment enclosure		X				
	Front of the Equipment Display		X				
 ATENÇÃO	<p>1 - Keeping the equipment within the ideal working temperature (50°C to 60°C) prolongs the useful life and avoids corrective maintenance.</p> <p>2 - The accumulation of dust and impurities in the installations can cause short circuit and burning of equipment and sensors.</p> <p>3 - After 10 years of use it is recommended to replace the equipment.</p>						

Table 2 – Preventive maintenance

EP4 INFORMATION LABELS

The EP4 Thermal Protection Relay of Electron do Brasil contains two laser engravings in its aluminum surroundings with important information that aims to facilitate its identification and characteristics and figures 4 and 5 illustrate the location of each label. The technical data label, which is adhesive on the top of the relay, contains the important technical information, and the serial number label is adhesive on the bottom of the casing, as illustrated in Figures 4 and 6.



EP4	Tensão de Operação Operation Voltage	24 ~ 275 Vdc / Vac - 50 / 60 Hz
	Entrada de Sensores Sensors Input	4 inputs Type RTD-PT-100 - 3 wires EN 60751 - DIN 43760
	Contato de Saída (relé) Output Contact (relay)	10 Amper - 70W / 250 VA
	Comunicação Serial Serial Communication	RS 485 - 2 wires Modbus RTU and DNP3 - L1
	Saída Analógica Analog Output	0~10, 0~20 or 4~20 mA

Cod. PA0059

Nome e código de
produto do EP4.





Dados técnicos
para uso do
EP4.

Figure 8 – Location of the technical data label.

Figure 9 – Technical data EP4



Número de
série do
equipamento.

 made in Brazil	Serial Number 12345678		
	Production Date 01-2023		
			
	www.electron.com.br		
	CNPJ: 07.643.915/0001-64 - FONE +55 11 4496 3827		

QR CODE acesso dados
do produto.

Data de fabricação
Semana/Ano.

Figure 10 – Location of the QR Code label.

Figure 11 – Label of serial number and date of manufacture of EP4.

EXAMPLES

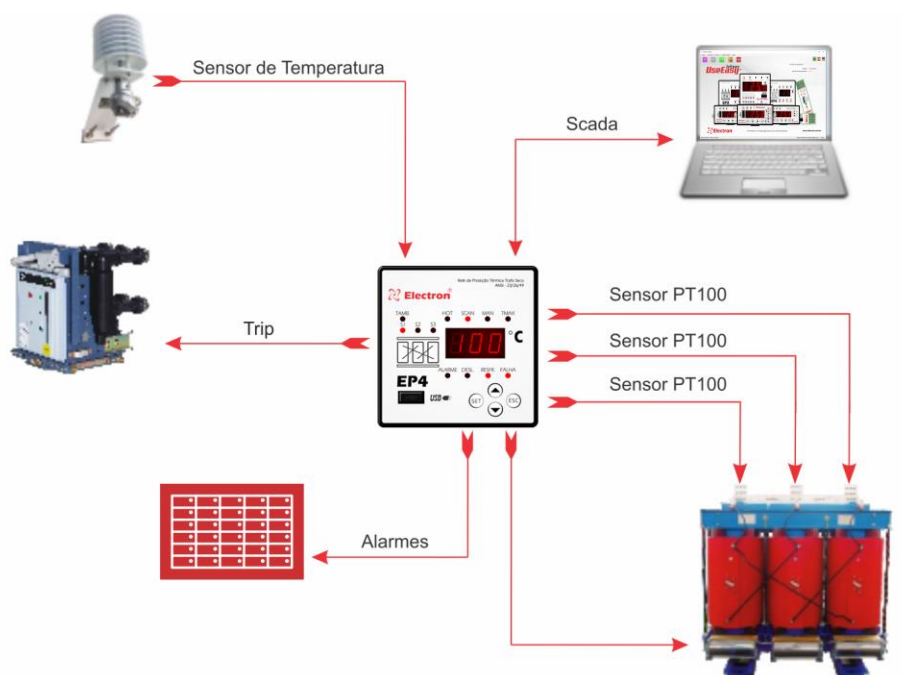


Figura 12 - EP4 monitorando Trafo seco com saída serial e comando de grupo de ventilação

INSTALLATION ACCESSORIES

Electron do Brasil has a line of accessories that can be purchased together in order to offer a complete solution to meet your application with practicality. We have listed some of the main accessories that can be used for EP4 operation.



PT-100 STFE temperature sensor: This sensor can be built with silicone bulb, stainless steel or Teflon. With electrical insulation capacity options of 2 kV, 10 kV or 15 kV. The PT-100 STFE temperature sensor has as a measuring principle to evaluate the variation of electrical resistance with temperature using the temperature coefficient of pure platinum (0.385 Ohm/K), according to IEC 751 (DIN 43760). Ideal for temperature monitoring of dry-type transformer windings due to its high accuracy and quality of materials, the PT-100 3-wire sensor is widely used in the market, as it greatly reduces the possibility of measurement error due to the compensation principle of the third sensor terminal.

Link da página do sensor de temperatura PT100 STFE da Electron:
<https://electron.com.br/site/produtos/rtd-pt100-2/>



PT-100 STE temperature sensor: This sensor is built stainless steel bulb AISI-304 injected aluminum head (IP 65) and adjustable buçim with BSP 3/4" and 1/2" threads or can be manufactured according to design. Its measuring principle is to evaluate the variation of electrical resistance with temperature using the temperature coefficient of pure platinum (0.385 Ohm/K), according to IEC 751 (DIN 43760). Ideal for installations subject to inclement weather and electrical disturbances for temperature monitoring of transformers and machines that require high measurement accuracy in environments subjected to electrical noise and weathering. The PT-100 3-wire sensor is widely used in the market, as it greatly reduces the possibility of measurement error due to the compensation principle of the third sensor terminal.

Link da página do sensor de temperatura PT100 STFE da Electron:
<https://electron.com.br/site/produtos/rtd-pt100/>



Double door panel for outdoor/outdoor use: Box for external use with double door for mounting instruments, accessories and passage of control wires and power of the power transformer. The external door contains glass display with UV protection for viewing the quantities measured by the temperature monitor and the panel contains special paint that is weather resistant and its degree of protection is IP 55, as NBR IEC 60529:2017.

Link da página do painel de porta dupla para uso externo – IP 55:
<https://electron.com.br/site/produtos/painel-para-uso-externo-ip55/>



Reference card for PT-100 signal: This accessory was developed to perform the verification of the temperature value displayed by equipment with input of RTD PT-100 sensors of 3 wires. It consists of precision resistors that send an equivalent fixed and constant resistance signal for selection between 3 different ranges, 0 °C (100 Ohms), 26 °C (110.9 Ohms) and 200 °C (175.86 Ohms).

Link da página do Cartão Referência para sinal de PT-100:
<https://electron.com.br/site/produtos/>

GETTING TO KNOW EP4

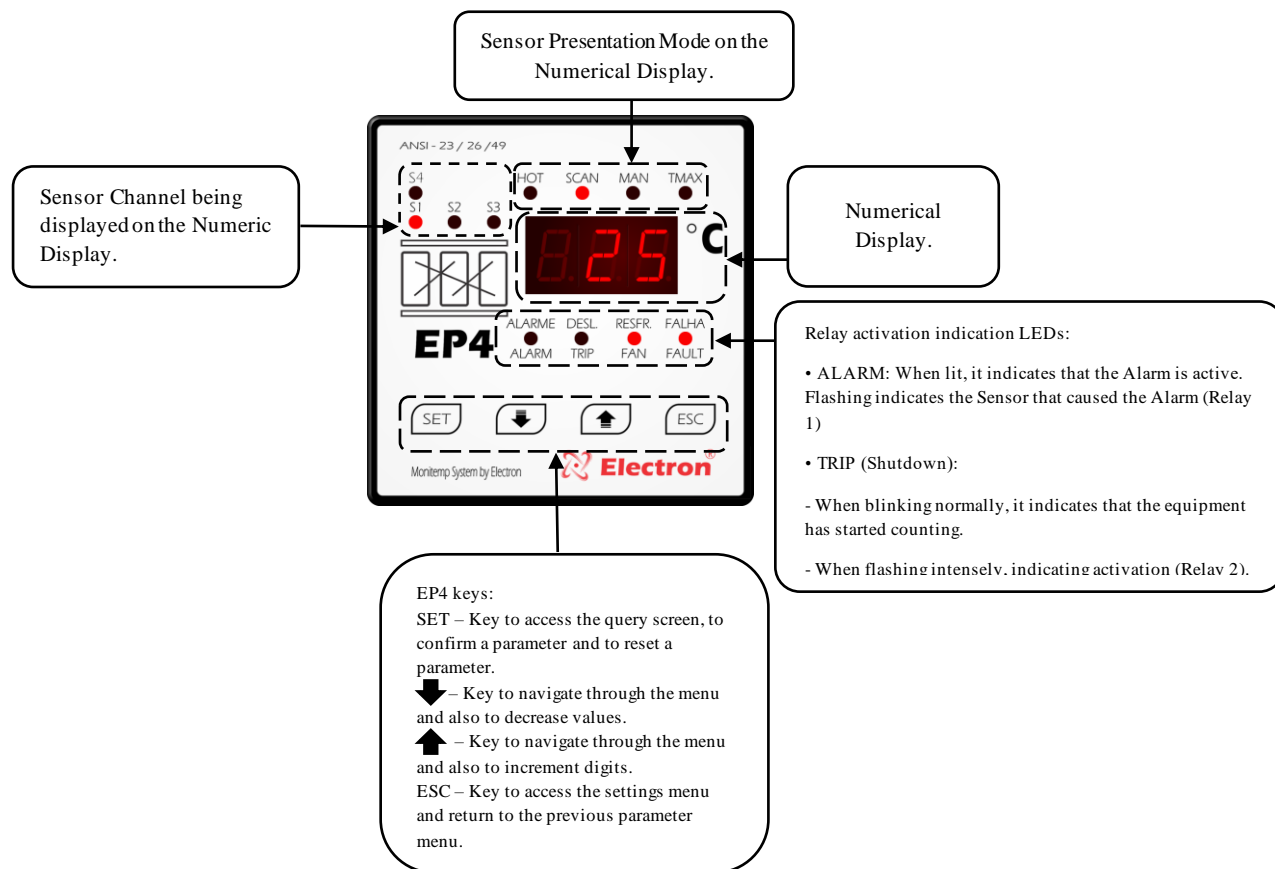
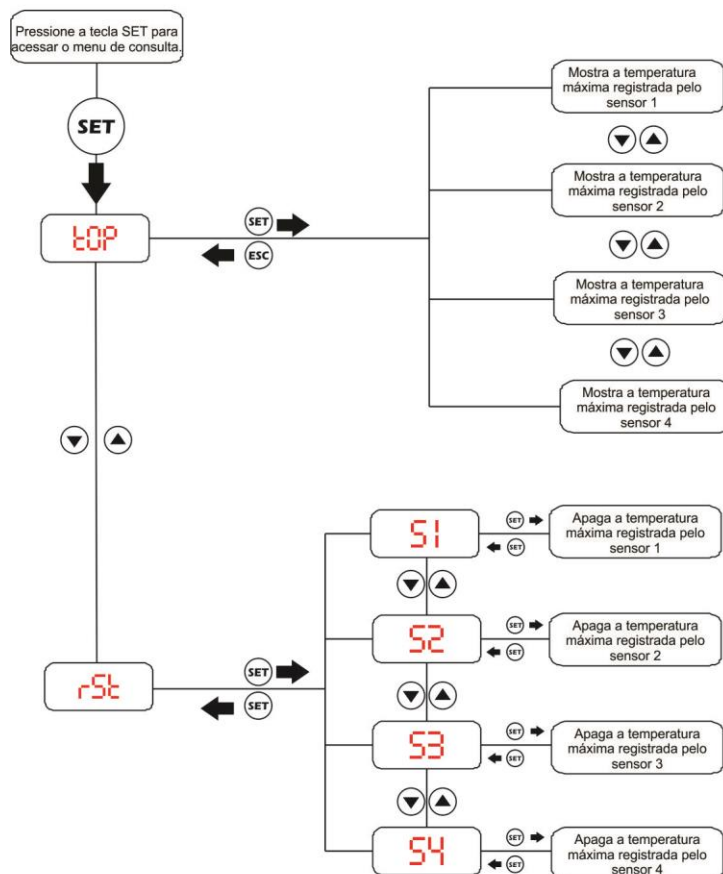


Fig. 13 – Front EP4

QUERY MENU FLOWCHART

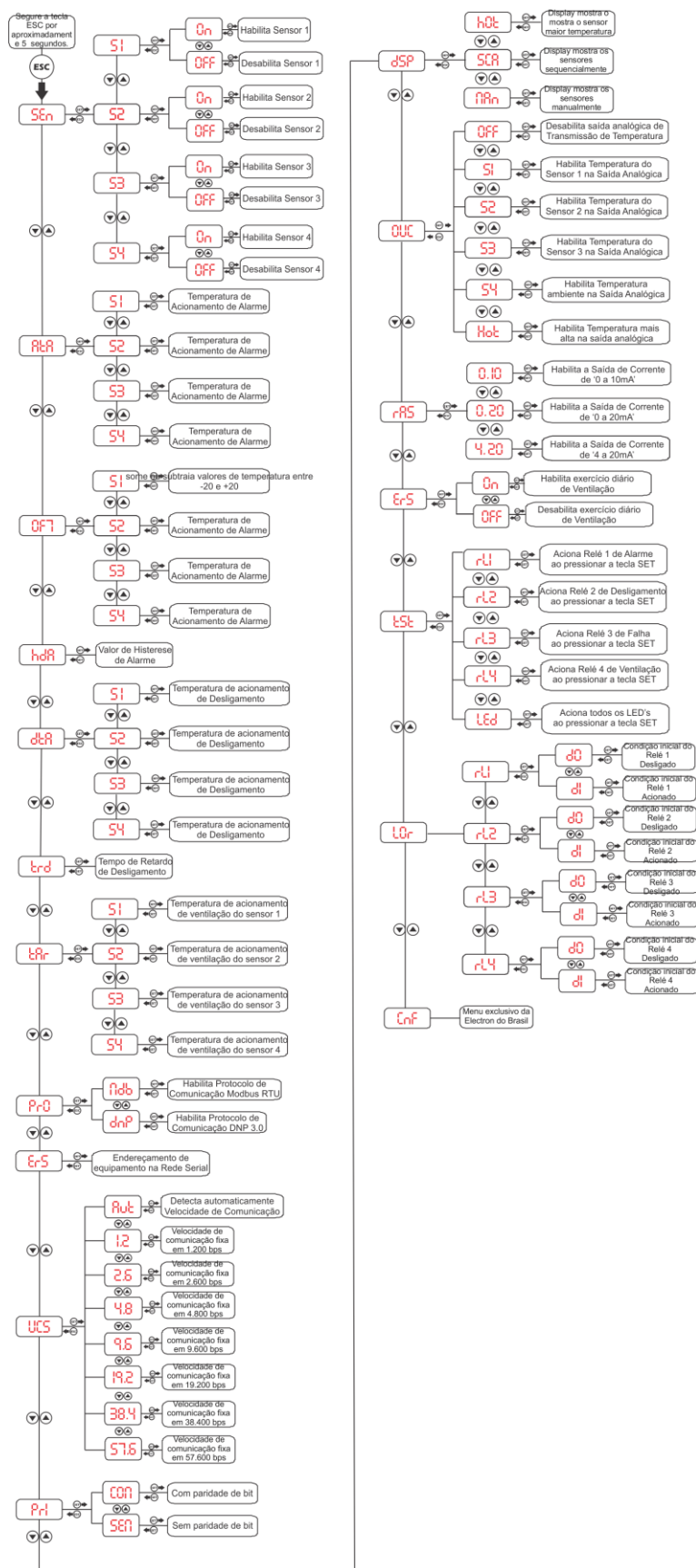
To view the maximum temperatures reached on each sensor, press the **SET** key and then use the increment or decrement keys to navigate the menu, to query the desired parameter press once **SET** key, to return to the previous menu press the **ESC** key.



QUERY MENU

Menu	Parameters	Description
top	S1 S2 S3 S4	Menu to view the maximum temperature reached by each sensor. Use the increment and decrement keys to select the desired sensor and view its respective maximum temperature. To exit this menu, press the ESC key.
rSt	S1 S2 S3 S4	Menu to reset (erase) the last maximum temperature record recorded on the respective sensor. Confirm the Reset command by pressing the SET key for each sensor. To exit this menu, press the ESC key.

CONFIGURATION FLOWCHART




CONFIGURATION MENU

Menu	Parameters	Variable	Description
SEn	S1 S2 S3 S4	ON - OFF	Menu to enable and/or disable sensor input. Select the ON or OFF option from the menu and confirm it by pressing the SET key.
OF7	S1 S2 S3 S4	+20 a -20	Increment or decrease temperature values to values for temperature measurement adjustment.
AtA	S1 S2 S3 S4	0°C / 200°C	Menu to configure the alarm trigger temperature (High Temperature Alarm). When any sensor reaches the configured temperature, the ALARM relay is triggered (terminals 31, 32 and 33) and the ALARM LED on the front of the equipment begins to flash indicating that the alarm is active. Set the desired ALARM relay drive temperature for each sensor and confirm it by pressing the SET key.
hdA	---	0°C / 10°C	Menu for setting Hysteresis (Alarm Shutdown Hysteresis). Temperature difference to deactivate the ALARM relay (terminals 31, 32 and 33), which can be adjusted with values between 0°C and 10°C. Example: If the temperature (AtA) is programmed at 100°C and the difference (hdA) programmed at 5°C , the ALARM relay LED will be flashing between the 95°C and 100°C variations and will turn off only when the temperature reaches any value below 94°C . Set the desired Alarm Hysteresis value and confirm it by pressing the SET key.
dtA	---	0°C / 200°C	Menu for setting Shutdown Temperature (High Temperature Shutdown). When the sensor reaches the temperature configured in this menu (dtA) the LED of the TRIP relay (terminals 34, 35 and 36) will begin to blink starting the time count (trd) for the shutdown. During the count, the time set in trd will also be shown on the numeric display.

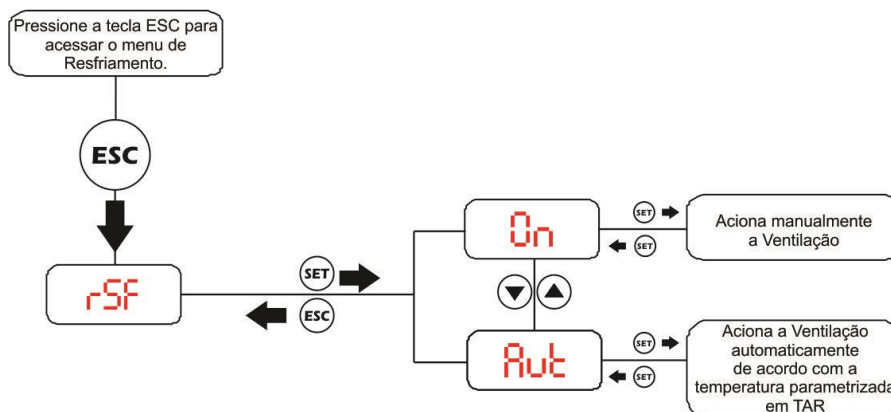
			<p>Example: If the Display displays 1 it means that the shutdown will occur within 1 minute.</p> <p>At the end of the count, the LED of the TRIP relay will be flashing intensely on the front of the equipment indicating its drive and the equipment that the system is protecting will be turned off. If the configured value is 0, the TRIP relay will trigger immediately. Set the shutdown temperature of each sensor and confirm by pressing the SET key.</p>
trd	---	0 / 20	<p>Menu to adjust the Timing for shutdown from 0 to 20 minutes. When the temperature of the dtA sensors S1, S2 or S3 reaches the configured value, EP4 will start counting the time to effect the shutdown. If the configured value is '0', the TRIP relay will trigger immediately.</p> <p>Set the desired Shutdown time and confirm by pressing the SET key.</p>
tAr	S1 S2 S3 S4	0°C / 200°C	<p>Menu to adjust the Cooling Drive Temperature (Ventilation). Upon reaching the value programmed in this parameter, the FAN Relay (post 40, 41 and 42) will trigger and its respective LED will illuminate, indicating the activation of cooling.</p>
hdr	---	0°C / 30°C	<p>Cooling Hysteresis Menu, temperature difference to turn the Cooler on and off.</p> <p>Example: If the temperature set in the tAr menu is 65°C and this menu hdr, is 5°C the cooler will turn off when the temperature is less than or equal to 59°C. That is, with exactly 5°C of difference less than the parameterized value in the tAr menu.</p>
for	---	Member of the Bundestag DnP	<p>Menu to enable one of two Communication Protocol options:</p> <ul style="list-style-type: none"> - Press the SET key on Modb to enable the Modbus RTU Communication Protocol. - Press the SET key on dnp to enable DNP 3.0 Communication Protocol
ErS	---	---	Serial Network Address.
UCS	Aut 1.2 2.4 4.8	---	<p>Serial Communication Speed Menu:</p> <p>Aut Automatically Detects Communication Speed;</p> <p>1.2 Fixed communication speed at 1,200bps;</p>

	9.6 19.2 38.4 57.6		2.4 Fixed communication speed at 2,400bps; 4.8 Fixed communication speed at 4,800bps; 9.6 Fixed communication speed at 9,600bps; 19.2 Fixed communication speed at 19,200bps; 38.4 Fixed communication speed at 38,400bps; 57.6 Fixed communication speed at 57,600bps;
PrI	CON SEN	- - -	Enable or disable the bit parity of the equipment, being: CON - With parity; SEN - No parity;
dSP	Hot SCA In	- - -	Menu to select temperature view: hot HOT Mode, displays only the sensor with the highest temperature; SCA SCAN Mode, displays the temperature of the 4 sensors sequentially and automatically; MAN MANUAL Mode, displays the temperature of the 4 sensors only through the navigation keys;
ouc	OFF S 1 S 2 S 3 S 4 Hot	- - -	Menu to adjust the channel to be transmitted in the analog output (Terminals 21 and 22): OFF Disables analog temperature transmission output; S 1 Enables the temperature of Sensor 1 in the Analog Output; S 2 Enables the temperature of Sensor 2 in the Analog Output; S 3 Enables the temperature of Sensor 3 in the Analog Output; S 4 Enables ambient temperature in Analog Output; hot Enables the highest temperature in the Analog Output;
rAS	0.10th 0.20th	- - -	Current output range menu (Terminals 21 and 22) where the user can select one of the first 3 options following options:

	4.20th		<p>0.10 Enables current output from 0 to 10mA; 0.20 Enables current output from 0 to 20mA; 4.20 Enables current output from 4 to 10mA;</p>
Erc	- - -	On / OFF	<p>Menu schedule of the daily exercise of the fans. On Daily exercise disabled; OFF Daily exercise enabled; Select the option you want, and then confirm by pressing the SET key. After 1 minute of the programming confirmation in On the Ventilation Exercise will be triggered for the first time for 5 minutes (LED FAN flashing), this cycle will be repeated every 24 hours after the first activation. NOTE: If the equipment is de-energized the cycle will be repeated.</p>

tSt	rL1 AdS rL2 rL3 rL4 LEd	---	 <p>Attention when using this menu, it activates the relay outputs and lights the EP4 LEDs so that the operator can make sure they work. However, if the monitor is in operation and the TRIP relay (shutdown) is connected to the protection of the system, it will trigger and the protection and the system will operate by turning off the transformer or the machine that it is protecting.</p> <p>rL1 - "Triggers relay 1 after pressing the SET key " (ALARM Relay).</p> <p>rL2 - "Triggers relay 2 after pressing the SET key" (TRIP Relay).</p> <p>rL3 - "Triggers relay 3 after pressing the SET key " (Relay FAULT).</p> <p>rL4 - "Triggers relay 4 after pressing the SET key " (FAN Relay).</p> <p>LEd - "Triggers all LED's of the display by pressing the SET key".</p>
thelr	rL1 rL2 rL3 rL4	do di	<p>Menu for choosing Relay Logic.</p> <p>do – Initial Conditions of the "Off" Relay.</p> <p>di – Initial Conditions of the "Triggered" Relay.</p> <p>Select the desired Logic and confirm by pressing the SET key.</p>
Cnf	---	---	<p>Exclusive Menu Electron do Brasil.</p> <p>To exit the menu, press the SET key.</p>

FAN DRIVE FLOWCHART



FAN DRIVE MENU

Menu	Parâmetros	Descrição
rSF	On Aut	Menu “Resfriamento” para acionamento Manual ou Automático dos ventiladores. Utilizando a tecla de navegação utilize On que aciona manualmente o resfriador e Aut e que configura o acionamento automático.

DEFECT SOLUTION

The sensor automatically returns to reading mode when the error is normalized, to reset **the EP4 press the SET key for approximately 5 seconds until the word rST appears on the display, then release and the EP4 Protection Relay will restart.** The **EP4** will trigger the **RELAY FAULT** (terminals 37, 38 and 39) in case the display displays the **OFF** parameter or if there is a power drop

Display	Cause	Solution
OFF	EP4 does not receive signal Reliable sensor	<ul style="list-style-type: none"> • Check and Replace the sensor cable if it is not shielded. • Check grounding of the sensor cable. • Check and eliminate possible bad contact in the connectors. • Replacement of the temperature sensor if it is damaged.

IMPORTANT RECOMMENDATIONS

Before putting into operation the equipment check the following recommendations:

1. All sensors as well as equipment must be grounded, do not use the same grounding point for power and for the sensor if it is used to ensure that there is no potential difference between them. Properly grounded sensors and power supply prevent malfunction or damage in cases of disturbances, surges, and inductions in the equipment.
2. Do not use **the EP4** directly in the sun, whenever it is urged in the field it is important to have a panel with smoked glass, in order to filter the ultraviolet rays that attack the frontal polycarbonate, in this way the life of the equipment will be prolonged.

WARRANTY TERM

The **EP4** Electron has a warranty period of two years from the date of sale consigned on the invoice, with coverage for any manufacturing defects that make it unsuitable or unsuitable for the applications it is intended.

Disclaimer of Warranty

The warranty does not cover transportation expenses for technical assistance, freight and insurance for shipment of product with evidence of defect or malfunction. The following events are also not covered: Natural wear of parts by continuous and frequent use, damage to the outside caused by falls or improper packaging; attempted repair / violation of seal with damage caused by persons not authorized by Electron and in disagreement with the instructions that are part of the technical description.

Loss of Warranty

The product will automatically lose its warranty when:

- The instructions for use and assembly contained in this manual and the installation procedures contained in Standard NBR 5410 are not observed;
- Subjected to conditions outside the limits specified in the respective technical descriptions;
- Violated or repaired by a person other than Electron's technical team;
- The damage is caused by a fall or impact;
- Infiltration of water or any other liquid occurs;
- Overload occurs that causes degradation of components and parts of the product.

Use of the Warranty

To take advantage of this guarantee the customer must send the product to Electron along with a copy of the purchase invoice duly packed so that there is no damage in transport. For an emergency service it is recommended to send as much information as possible, referring to the defect detected. This will be analyzed and subjected to full functional tests.

The analysis of the product and its eventual maintenance will only be carried out by the technical team at the headquarters of Electron do Brasil.

SPECIFICATION FOR ORDER

Equipment: **EP4 Thermal Protection Relay.**
Product Code: **PA0059.**







Click on the link below to request a quote directly through our website:

<https://electron.com.br/site/produtos/ep4/>

EP4 – Temperature Monitor for Dry Traffic - 4 PT100 Sensors - Electron - Digital Technology

SUPPORT AND CONTACT

For other questions, suggestions, questions or for any other matter related to this or other products manufactured by Electron do Brasil, please contact us through the following contacts:

-  → **Address:** Avenida Brasil n. 2436, Bairro Lagoa, Itupeva–SP - 13.296-122
-  → **Phone:** (11) 4496-3627
-  → **Mobile:** +55 (11) 94133-7472 (Sales) / +55 (11) 93745-6828 (Technical Support)
-  → **website:** www.electron.com.br
-  → **e-mail:** vendas@electron.com.br (For commercial dealings)
-  → **e-mail:** tecnico@electron.com.br (For questions, information and technical queries/application)

DECLARATION OF CONFORMITY

Available for download at the following email address:

<https://electron.com.br/pt-br/produtos/ep4/>

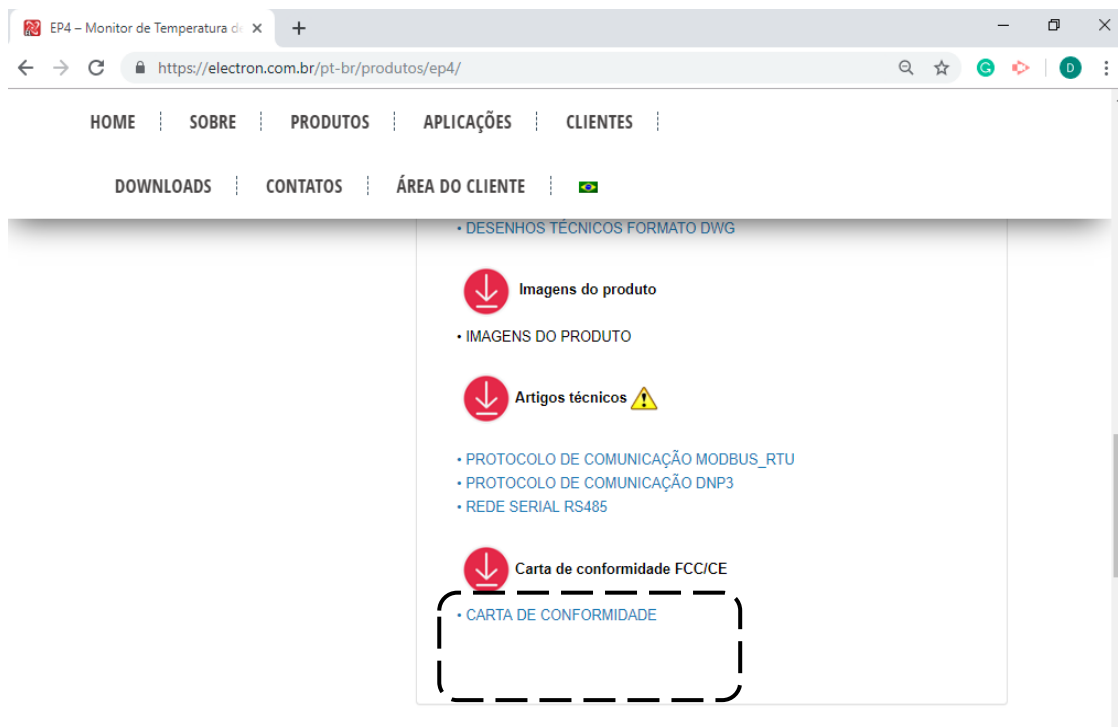


Figure 14 - Download Declaration of Conformity

REVISION CONTROL

Revision No. 0 – November /2013.

- Issuance of the Manual;

Revision No. 2.1 – August/2011.

- Change of supply voltage range from 48 to 275 Vdc/Vac to 24 to 275 Vdc/Vac

Revision No. 3.0 – August 2015

- Change in the Register Map and addition of Serial Communication Speed menu;

Revision No. 5.0 – October/2017.

- Menu addition for the selection of Modbus RTU or DNP3 Communication Protocol;

Revision No. 6.0 – September/2021.

- Spelling, change of fonts, addition of menu Communication Protocol,
- Layout change,
- Separation Map of Registers;
- Purchase specification update;
- Update of flowcharts and addition of diagrams of connection of equipment with two and three analog outputs;
- Bit parity menu addition;
- Added Offset menu;

Revision N° 7.0 – 07/17/2023

- Overhaul