

Thermostat for elevator shafts ventilation TOA-T101 and TOA-T102

Overview

The TOA is an electronic thermostat (temperature monitor) preconfigured for elevator shaft ventilation with for 230 VAC or 24 V AC/DC spring return actuators.

If the measured temperature exceeds the temperature limit, the thermostat switches off its output. If the temperature returns to within the allowed limit, the output is switched back on.

The thermostat can work for heating or cooling applications.

The TOA is delivered with a maximum temperature limit of 35°C (95 °F) and an allowed limit of 30 °C (86 °F)

The thermostat is preconfigured for elevator shaft ventilation but can also be used for heating or cooling applications.

It can be adjusted by the user with the OPA-S operating terminal if required.



Features

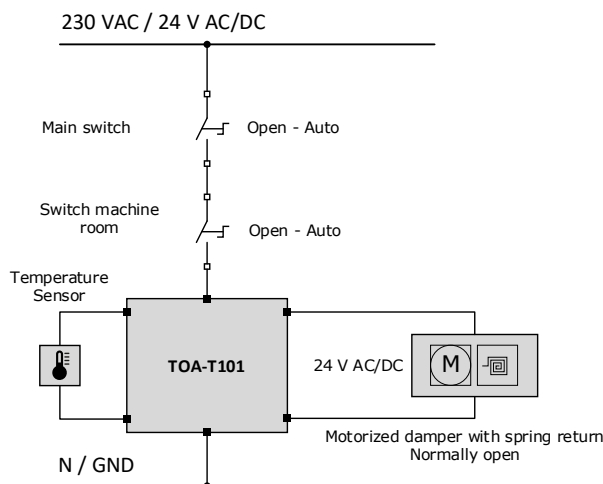
- TOA-T101:
 - 230 VAC or 24 V AC/DC power supply
 - 24 V output
- TOA-T102:
 - 230 VAC power supply
 - 230 VAC output
- Adjustable switch on and off temperature limits.
- -20...100 °C (-4...212 °F) adjustment range
- 0.5 °C (1 °F) measuring accuracy
- Signal LED indicates operating status of Thermostat
- Temperature can be measured at the device or remotely
- Easy programming of settings with external control unit
- Quick copying of predefined settings using a memory device

Applications

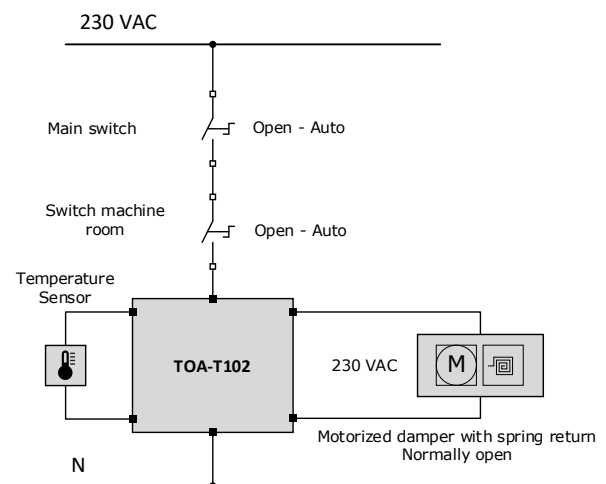
- Ventilation damper control for elevator shafts.
Control of damper for temperature control in an elevator shaft by opening or closing the motorized dampers (with spring return). Turning the contact off opens the damper, turning the contact on closes the damper.
- Frost protection
Activating a heating device if temperature gets close to freezing.

Examples

Elevator shaft ventilation with TOA-T101:



Elevator shaft ventilation with TOA-T102:



Product Testing and Certification



Declaration of
Conformity

Information on the conformity of our products can be found on our website
www.vectorcontrols.com on the corresponding product page under "Downloads".

Types and Ordering

Product Name	Product No.	Description / Configuration	Option
Thermostat			
TOA-T101	40-100242	230 VAC or 24V AC/DC power supply for 24 V actuators Without temperature sensor	For 24 V actuators without sensor
TOA-T101-S5	40-100295	230 VAC or 24V AC/DC power supply for 24 V actuators Including temperature sensor S-Tn10-005-A	For 24 V actuators with sensor
TOA-T102	40-100243	230 VAC power supply, for 230 VAC actuators Without temperature sensor	For 230 V actuators without sensor
TOA-T102-S5	40-100296	230 VAC power supply for 230 V actuators including temperature sensor S-Tn10-005-A	For 230 V actuators with sensor.
Temperature sensor if not included must be ordered separately:			
S-Tn10-005-A	40-200210	Temperature sensor for measuring at the thermostat	5 cm, PVC-cable
SOD-Tn10-1	40-200211	Temperature sensor for remote mounting	1 m, PVC-cable
Accessories			
OPA-S	40-500006	External operation terminal with LCD display	
AEC-PM2	40-500130	Memory device for easy copying of settings	

Safety

DANGER! Safety advice

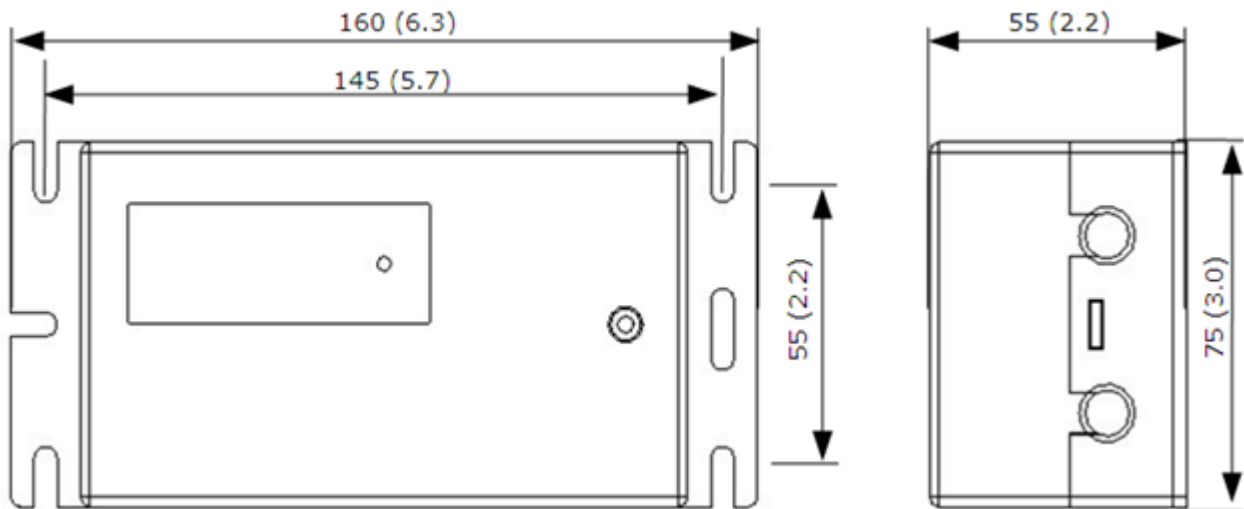
This device is for use as a temperature control unit. It is not a safety device. Where a device failure could endanger human life and property, it is the responsibility of the client, installer and system designer to add additional safety devices to prevent system failure. Ignoring specifications and local regulations may cause equipment damage and endangers life and property. Tampering with the device and misapplication will void warranty.

Technical Specifications

Power supply	Input voltage:	TOA-T101: 24 V	24 VAC, $\pm 10\%$, 50/60 Hz 24 VDC, 15...34 VDC Power consumption without Actuator: 2 VA Safety extra low voltage (SELV): HD 384, Class II
		TOA-T101: 230 V TOA-T102	230 VAC, $\pm 10\%$, 50/60 Hz
	Electrical connection	Screw terminals, cable 2x 0.34...2.5mm ² (AWG 22...14)	
Outputs	Switching logic	Relay, normally closed	
	Output voltage:	TOA-T101: 24 V TOA-T101: 230 V TOA-T102	If powered with 24 V AC/DC: 24 V AC/DC If powered with 230 VAC: 24 VAC 230 VAC
	Output power:	TOA-T101: 24 V TOA-T101: 230 V TOA-T102	If powered with 24 V AC/DC: according to power supply If powered with 230 VAC: max 400 VA Max. 400 VA
	Relay output: SPST (NO)	2 A Full load current	
	Insulation strength	4000 VAC between relays and system electronics 1000 VAC between neighboring contacts	
	Electrical connection	Screw terminal, cable 2x 0.34...2.5mm ² (AWG 22...14)	
Inputs	Type	External temperature sensor: Sxx-Tn10 (NTC 10k Ω @25°C)	
	Range	-20...100 °C (-4...212 °F)	
	Accuracy	0.5°C at 0...50 °C (32...122 °F) 1.0°C at -20...0 °C (-4...32 °F) / 50...100 °C (122...212 °F)	
Environment	Operation	To IEC 721-3-3	
	Climatic conditions	Class 3K5	
	Temperature	0...50 °C (32...122 °F)	
	Humidity	< 95 % RH non-condensing	
	Transport & storage	To IEC 721-3-2 and IEC 721-3-1	
	Climatic conditions	Class 3K3 und class 1K3	
Temperature	-25...70 °C (-13...158 °F)		
Humidity	< 95 % RH non-condensing		
Mechanical conditions	Class 2MT2		

Technical specification (continued)

Standards	Degree of protection	IP40 (EN 60529)
	Overvoltage category	III (EN 60730-1)
	Safety class	II (IEC 60536)
	Environmental class	II (EN 60730-1)
General	Material	PC+ABS plastic
	Dimensions (L x W x H)	160 x 75 x 55 mm (6.3 x 3.0 x 2.2 inch)
	Weight (including package):	
	TOA-T101	465 g (16.40 oz)
TOA-T102	305 g (10.76 oz)	

Dimensions, mm (inch)

Mounting and Installation

The Thermostat must be mounted on a dry place.

Temperature sensor selection

Use Vector Controls NTC temperature sensors to achieve maximum monitoring accuracy. Different cable lengths simplify the installation of the temperature sensor:

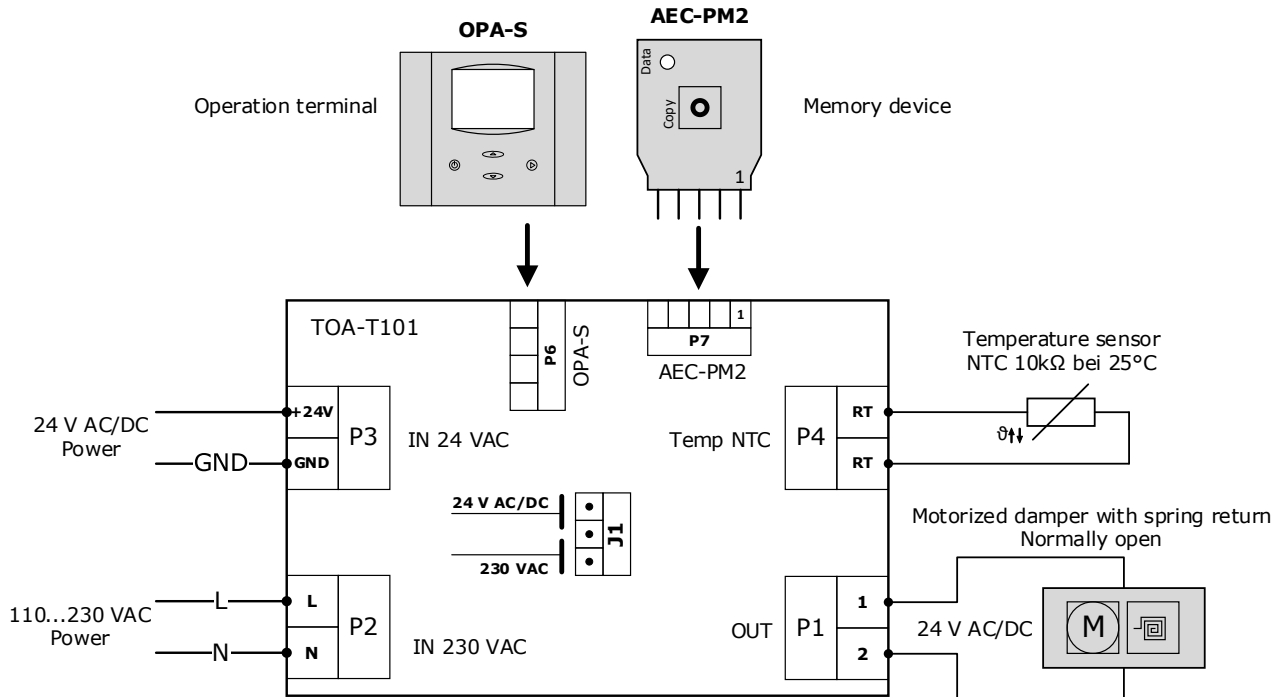
- For temperature measurements at the TOA, use the probe with short cable (5 cm).
- For remote temperature measurements, use the probe with long cable (1 m).

For more information, see "Ordering Information" on page 2.

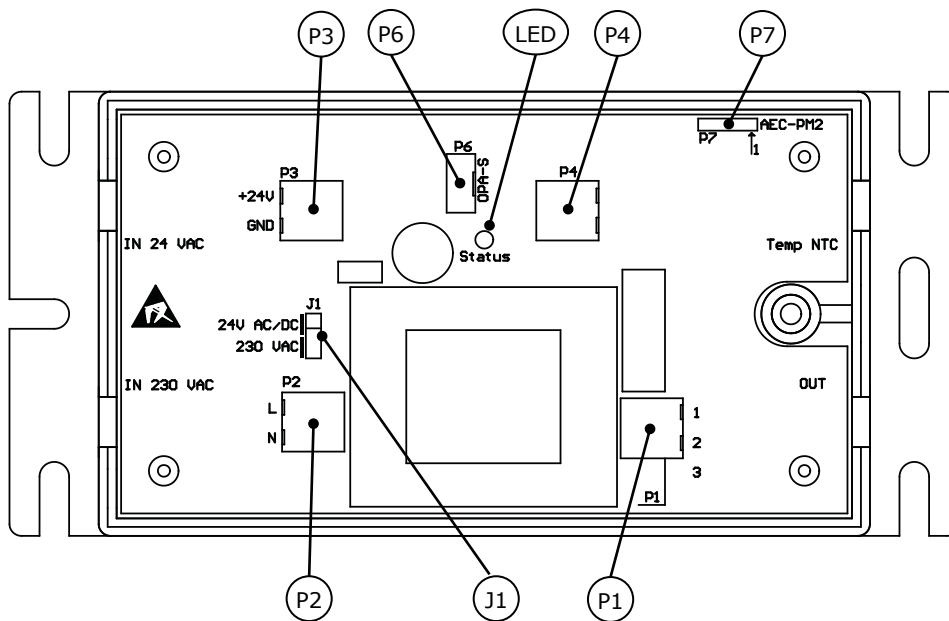

Important

The temperature sensor must not be exposed to direct sunlight!

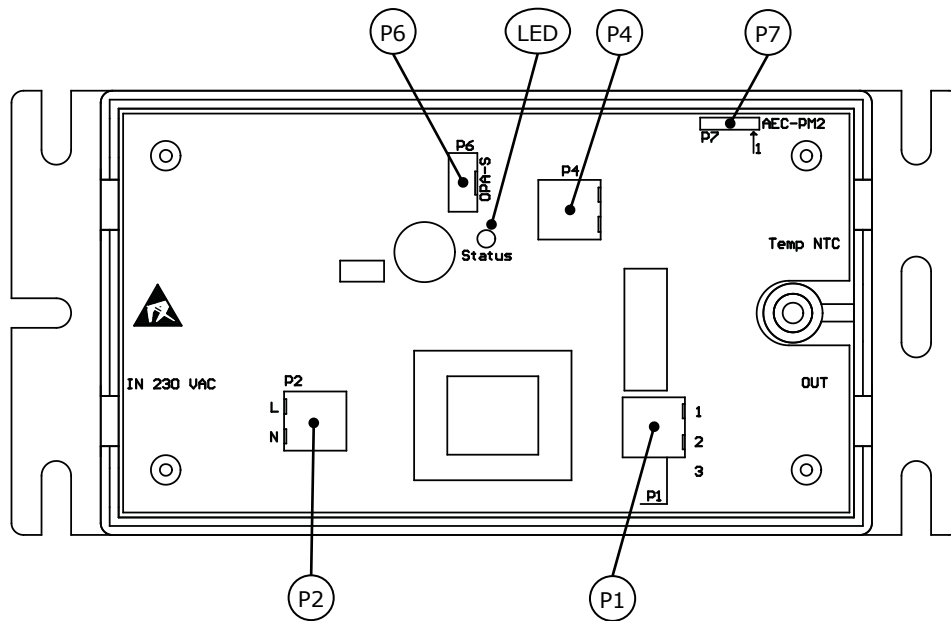
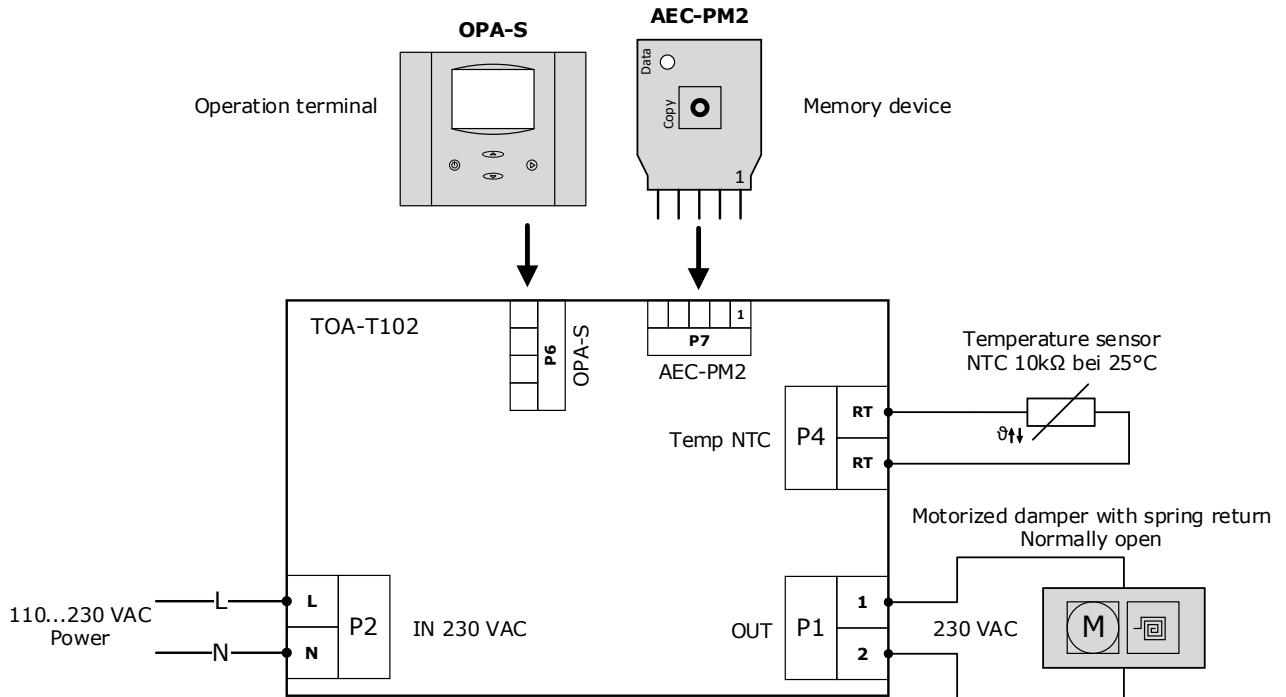
Wiring and Connection TOA-T101



! **Important**
 The power supply for the TOA-T101 is either 24 V AC/DC or 230 VAC!
 The jumper J1 **must** be set according to the supply voltage!



Pos.	Function	Component
P1	Output 24V: Connection for controlled actuation device.	Connection terminal
P2	Input: Power supply 230 VAC, 50/60 Hz	
P3	Input: Power supply 24 V AC/DC	
P4	Input: Temperature sensor NTC 10kΩ at 25 °C	
P6	Connection for OPA-S operation terminal	Plug
P7	Connection for AEC-PM2 memory device	Plug
J1	Connector for configuration of supply voltage 24 V AC/DC or 230 VAC	Jumper
LED	Signal LED shows operating status	LED

Wiring and Connection TOA-T102


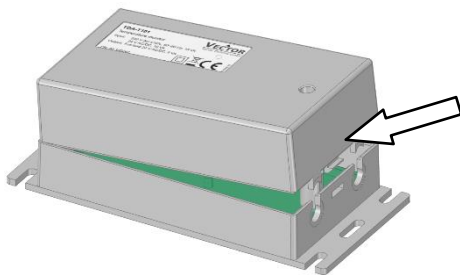
Pos.	Function	Component
P1	Output 230 VAC: Connection for controlled actuation device	Connection terminal
P2	Input: Power supply 230 VAC, 50/60 Hz	
P4	Input: Temperature sensor NTC 10kΩ at 25 °C	
P6	Connection for OPA-S operation terminal	Plug
P7	Connection for AEC-PM2 memory device	Plug
LED	Signal LED shows operating status	LED

Connecting the TOA and putting it into operation

Important

The electrical connection of the TOA must be made in accordance to the local regulations.

1. Loosen the locking screw with a Phillips or slotted screwdriver and remove the upper part of the housing. To do this, press in the upper part of the housing on the side next to the locking screw slightly so that the locking hook disengages (see picture below).
2. Connect the device according to the connection diagram. To do this, push the cable through the supplied cable strain relief (kink protection) and connect it to the terminals. Tighten the terminal screws with max. 0.4 Nm. Position the cable strain relief in the housing cut-out and attach cable ties for strain relief (see picture below). Note: Open the screw terminal completely to connect the cable correctly.
3. Only for TOA-T101: Position the jumper J1 according to the operating voltage of the power supply used (see picture below).
4. Close unused housing cable cut out with the supplied blind insert (see picture below).
5. Apply operating voltage to TOA and observe signal LED (see section "Signal LED", page 7). The signal LED should light up green after the device startup and the contact is opened.
6. Verify the function of the TOA. To do this, disconnect the temperature sensor connected to terminal P4 while the device is running. The signal LED flashes red and the contact opens. After successful function test, reconnect cable. Signal LED lights up green and contact closes.
7. Set temperature limit if required (see section "TOA Parameters", page 8) or copy prepared TOA parameters with memory device into the TOA (see section "Copy TOA parameters", page 9). Preset are limits of 35°C / 30°C (95 °F / 86 °F).
8. Close the housing. Make sure that the two hooks of the upper part of the housing engage correctly in the lower part of the housing and that the hook on the other side engages correctly. Tighten the locking screw (max. 0.5 Nm).

Open TOA housing


Completely loosen the locking screw and press here to open the housing.

Cable connection with cable lock (example with TOA-T101 and 230 VAC power supply)

Jumper J1 (TOA-T101 only)

Power	24 V	230 V
J1		

Place jumper according to the used operating voltage.

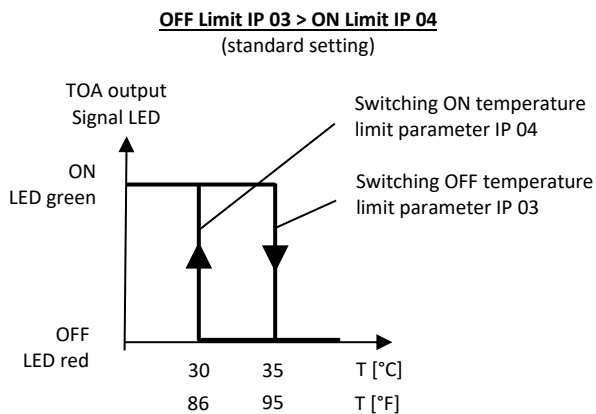
Operation

The device is preconfigured according to the enclosed documentation. Settings such as switching on and switching off temperature limits can be adjusted. The OPA-S operating/programming unit is used for configuration. This can also be used to display the measured values (see section "TOA Configuration", page 8).

Thermostat function

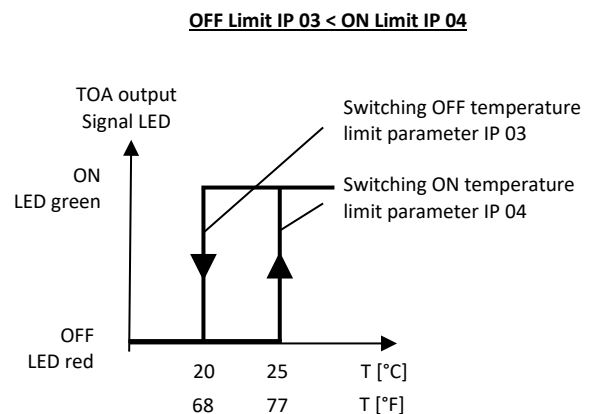
▲ OFF Limit > ON Limit (standard setting)

The following diagram shows the temperature-dependent switching behavior of the TOA output voltage for the standard OFF / ON setting of 35 °C / 30 °C (95 °F / 86 °F).



▲ OFF Limit < ON Limit

The following diagram shows the temperature-dependent switching behavior of the TOA output voltage for an OFF / ON setting of 20 °C / 25 °C (68 °F / 77 °F).

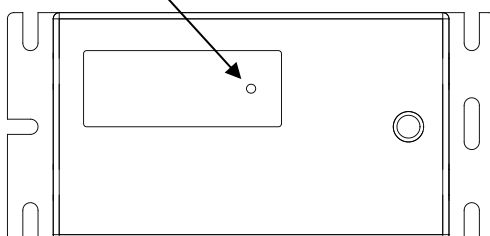


Signal LED

The signal LED on the top of the housing indicates the operating status of the TOA.

LED	Status	Description
red	Output is off	The contact is opened = 0 V
green	Output is on	TOA-T101 output voltage = 24 V AC/DC TOA-T102 output voltage = 230 VAC
green flashing	Device startup	TOA is starting up.
red flashing (2 sec. cycle)	Sensor error	Temperature sensor is not connect or failed.
green red repeated flashing	Output error	TOA output overloaded or short circuit at output.
dark	No power	Device has no power or is defect

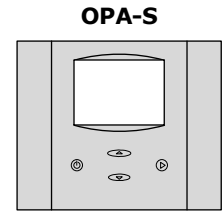
Signal LED



TOA Configuration

The OPA-S operating/programming unit is used for configuration. It can also be used to display the measured values.

The TOA password-protected parameters (see section "TOA Parameters", page 8) can be set directly on the device during operation through the OPA-S operating units. The OPA-S operating unit must be connected to the TOA connector P6 to adjust the parameters. This connection must not be disconnected earlier than two seconds after the last keystroke on the OPA-S.



If several TOA-T101 units are to be operated with the same settings, prepared parameters can be quickly copied to the individual units using the memory device AEC-PM2 (see section "Copy TOA parameters", page 9).

Change parameter settings

The TOA-T101 is delivered with a preset temperature limits of 35°C / 30°C (95 °F / 86 °F). Adjustments can be made to the settings for special requirements and customer requests.

1. Remove the upper part of the TOA housing (see section "Connecting the TOA and putting it into operation", page 6).
2. Connect the OPA-S operating device to the connector **P6** (see section "Wiring and Connection", page 4). The measured temperature is displayed.
3. Press the "UP" and "DOWN" keys simultaneously for at least 3 seconds and wait until "Code" is displayed.
4. Use the "UP" and "DOWN" keys to set the password "0009" and confirm with the "RIGHT" key.
5. Confirm the "IP SEL" display with the "RIGHT" key. The first parameter is displayed.
6. Change to the parameter "IP 03" with the "UP" or "DOWN" keys. After pressing the "RIGHT" key, the parameter "Switching OFF temperature limit" can be adjusted with the "UP" or "DOWN" keys. Confirm the setting with the "RIGHT" key.
7. Use the "UP" or "DOWN" keys to switch to the "IP 04" parameter. After pressing the "RIGHT" key, the parameter "Switching ON temperature limit" can be adjusted with the "UP" or "DOWN" keys. Confirm the setting with the "RIGHT" key.
8. Complete the parameter setting by pressing the left "ON/OFF" key twice. The measured temperature is displayed.



Important

The TOA can only apply the new settings correctly, if the parameter setting is completed with the left "ON/OFF" key!



Detailed information to the OPA-S can be found on the website www.vectorcontrols.com on the corresponding product page under "Downloads".

TOA Parameters

The parameters listed below define the behavior of the TOA. The parameters can be changed using the OPA-S operating/programming unit.

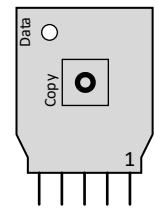


Detailed information to the OPA-S can be found on the website www.vectorcontrols.com on the corresponding product page under "Downloads".

Parameter	Description	Range	Default
IP 00	Temperature unit in Fahrenheit, °C = OFF, °F = ON	ON, OFF	OFF
IP 01	Number of measurements for average value determination	1...255	3
IP 02	Sensor-calibration	-10...10 °C	0
IP 03	Switching OFF temperature limit	-20...100 °C	35 °C
IP 04	Switching ON temperature limit	-20...100 °C	30 °C
IP 05	AEC-PM2 memory device commands / status 0: Standard, copy operation successful (status) 1: Copy all TOA parameters to AEC-PM2 memory device (command) 7: Copy operation failed (status)	0-7	0

Copy TOA parameters

It is possible to load TOA parameters to the memory device AEC-PM2 and copy them to other TOA devices.

AEC-PM2

Loading memory device

1. Remove the upper part of the TOA housing (see section "Connecting the TOA and putting it into operation", page 6).
2. Insert the AEC-PM2 memory device into the TOA connector **P7**. Ensure correct polarity (see section "Wiring and Connection", page 4)!
3. Connect the OPA-S operating device to the TOA connector **P6** (see section "Wiring and Connection", page 4). The measured temperature is displayed.
4. Press the "UP" and "DOWN" keys simultaneously for at least 3 seconds and wait until "Code" is displayed.
5. Use the "UP" or "DOWN" keys to set the password "0009" and confirm with the "RIGHT" key.
6. Confirm the "IP SEL" display with the "RIGHT" key. The first parameter will be displayed.
7. Use the "UP" or "DOWN" keys to switch to the "IP 05" parameter. After pressing the "RIGHT" key, use the "UP" or "DOWN" keys to set the parameter to "1". Confirm the setting with the "RIGHT" key.
8. After pressing the left "ON/OFF" key twice, the parameters are copied from the TOA to the AEC-PM2. The red "Data" LED of the AEC-PM2 lights up for 5 seconds after successful copying and parameter "IP 05" is set to 0. If copying has failed, the red "Data" LED flashes for 5 seconds and parameter "IP 05" is set to 7.
9. Remove the AEC-PM2 memory device and the OPA-S operator interface and close the TOA housing (see section "Connecting the TOA and putting it into operation", page 6).

Copy parameters to other TOA devices

1. Remove the upper part of the TOA housing (see section Connecting the TOA and putting it into operation, page 5).
2. Insert the AEC-PM2 memory device into the TOA connector P7. Ensure correct polarity (see section "Wiring and Connection", page 4)!
3. After pressing the "Copy" key on the AEC-PM2, the parameters are copied from the AEC-PM2 to the TOA. The red "Data" LED of the AEC-PM2 lights up for 5 seconds after a successful copy process. If copying has failed, the red "Data" LED flashes for 5 seconds.
4. Remove the AEC-PM2 memory device and close the TOA housing (see section "Connecting the TOA and putting it into operation", page 6).

Signal LED on the AEC-PM2 memory device

LED (red)	Status	Description
lights up	successful	Copying of parameters successfully completed. LED lights up for 5 seconds.
flashes	error	Error while copying the parameters. LED flashes for 5 seconds.

Additional Information
Conventions

The following display conventions apply to this document:


Danger

Indicates a hazard with a high degree of risk. Failure to observe this warning may result in immediate danger of serious injury or death.


Important

Failure to comply with these warnings can result in equipment damage.


Information

Further information, important operating instructions, other details.



Reference to another document or other text passages.

Used abbreviations

Abbreviation	Meaning
NTC	Negative Temperature Coefficient

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