

# Automation System TROVIS 6400

## Compact Controller TROVIS 6493



For panel mounting (front frame 48 x 96 mm/1.89 x 3.78 inch)

### Application

Microprocessor-based compact controller with flexible software design for automation of industrial and processing plants.



The TROVIS 6493 Compact Controller is suitable for use in simple control loops as well as for solving more complex control tasks.

The flexible software design allows the user to configure control circuits without modifying the hardware. The functions are stored in a read-only memory and can be adapted to the specific requirements of the respective control system.

### Special features

- Operation and configuration via 6 keys.
- Two inputs, one for standardized signals 0(4) to 20 mA or 0(2) to 10 V or for use as transmitter input, the second one can optionally be connected to a resistance thermometer Pt 100, Pt 1000, Ni 100, Ni1000 or to a potentiometer in the range of 0 to 1000  $\Omega$
- One binary input whose function is selectable
- Free choice of either continuous-action, three-step or on-off output
- External reference variable or two internal reference variables to be selected directly
- Bumpless transfer between manual and automatic mode by means of manual/automatic key or via binary input
- Filtering and function generation of input and output variables
- Linking of input variables (addition, subtraction)
- Reference variable ramp, output ramp
- Control signal limitation
- Definition of start-up and restart conditions
- Analog limit alarm
- Start-up adaptation
- Option of code number and keyboard locking
- Degree of protection IP 65 for front panel

### Versions

The TROVIS 6493 Compact Controller is equipped with a housing in the size 48 x 96 mm designed for panel-mounting.

**TROVIS** **6493-011**

Power supply	
230 V AC	1
120 V AC	2
24 V AC	3



Fig. 1 · TROVIS 6493 Compact Controller

## Inputs and outputs

The controller includes two inputs which can optionally be assigned to the controlled variable  $x$  or the reference variable  $w$ . Additionally, you can determine by software the input signal for each input. The input 1 can process signals between 0(4) to 20 mA or 0(2) to 10 V. You may also connect a two-wire transmitter. For the input 2 you also have several options, such as connection of either a resistance thermometer Pt 100, Pt 1000, Ni 100 or Ni 1000 or a potentiometer ranging from 0 to 1000  $\Omega$ .

The compact controller comprises a binary input that can be programmed by the user. This input may, for instance, switch over between current internal reference variable and external reference variable or start the reference variable ramp.

With the TROVIS 6493 you have the option of generating a continuous control signal, a binary signal or also a three-step signal. When programming an on-off output, you may use the continuous-action output as analog output for a recorder. This allows you to record the manipulated variable  $Y$ , the external reference variable  $WE$  or the error  $X_d$ .

The binary output can be used to issue messages and transmit them to an external system.

## Operation

The controller is operated using six keys whose functions depend on the level selected.

### Operating level

The operating level is the level the controller generally works in. After having switched on or restarted the controller, the display shows the controlled variable and the manipulated variable. The compact controller is in manual operating mode.

The selector key (8) can be used to switch to another variable to be displayed in the bottom line of the display (2), these are: internal reference variable  $W$  or  $W2$ , external reference variable  $WE$ , manipulated variable  $Y$  or error  $X_d\%$ . If you want another reference variable to become effective, then select it using the selector key and confirm with the enter key. The value of the internal reference variables  $W$  and  $W2$  can be changed via the arrow keys.

### Configuration and parameter level

You can access these levels via the enter key (7). In these levels, you have to adjust the parameters and functions of the compact controller to adapt it to the special requirements of your plant.

The functions are located in different levels which branch off to further sublevels.

The enter key is used to access the levels, to activate function blocks and parameters and confirm modified values. Using the arrow keys (4, 5), you can browse within a level backward and forward or you can switch to other function settings. Pressing the selector key (8), the parameters of the selected function are accessed. Each individual parameter can be called by pressing the enter key. Then, the arrow keys are used to set a new value which must be confirmed with the enter key.

You can return to the next higher level at any time by using the reset key (6).

The function blocks, parameters and calibration values can be protected against undesired modifications by means of a code number.

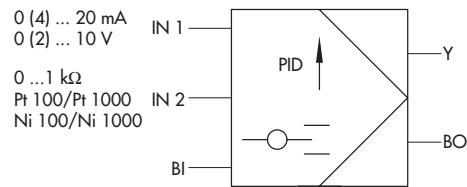
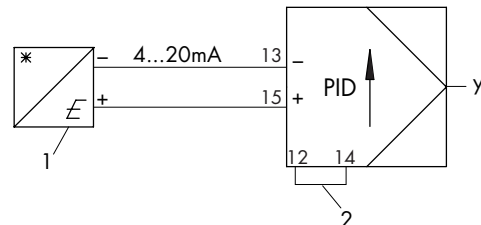
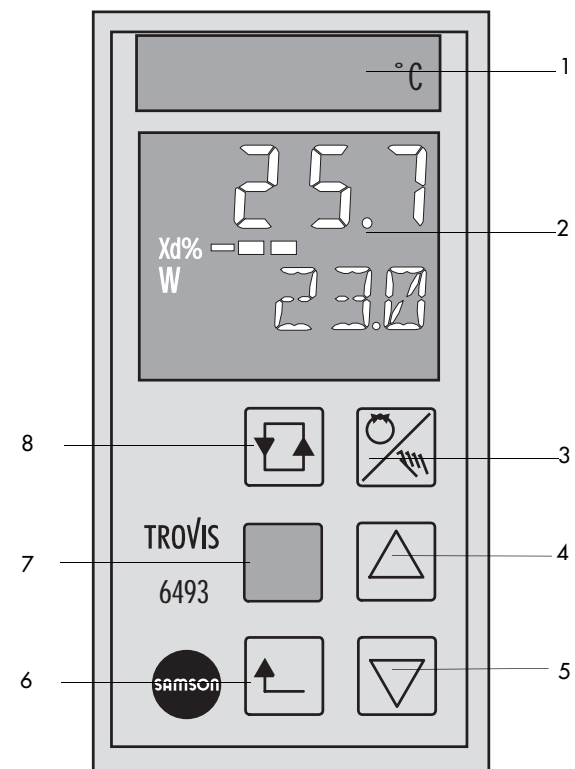


Fig. 2 · Block diagram



- 1 Two-wire transmitter
- 2 External bridge

Fig. 3 · Block diagram with two-wire transmitter



- 1 Exchangeable label
- 2 Display
- 3 Manual/Automatic key
- 4 Arrow key (increase, forward)
- 5 Arrow key (decrease, backward)
- 6 Reset key
- 7 Enter key
- 8 Selector key

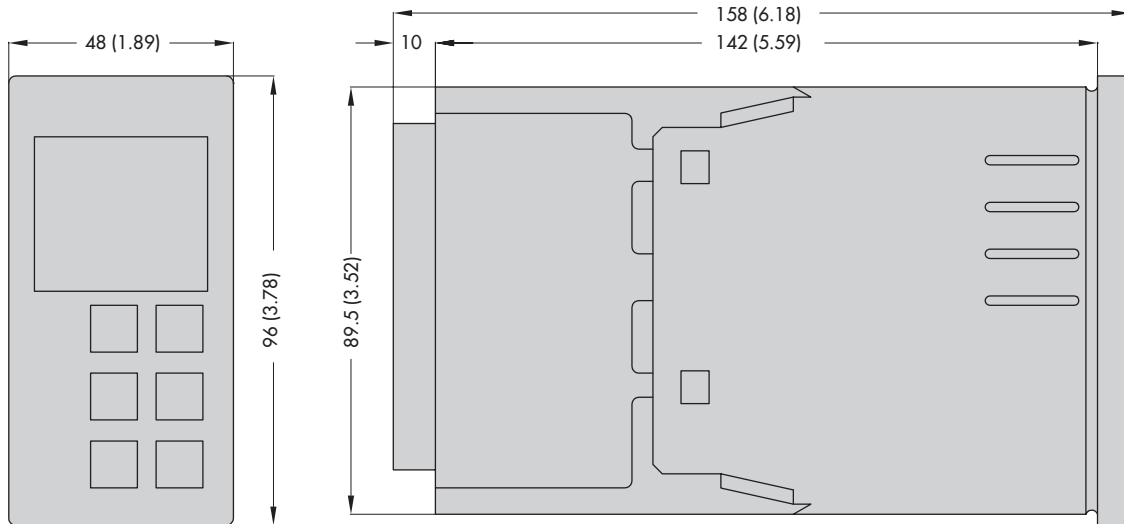
Fig. 4 · Operation

## Technical data

<b>Inputs</b>		Two analog inputs, optionally for controlled variable X or reference variable W
Analog input 1 Analog input 2		Two-wire transmitter for mA or V (see below) Temperature sensor or potentiometer (see below)
Input for mA or V	Measuring ranges	0(4) to 20 mA or 0(2) to 10 V
	Measuring range changeover	Carried out by software
	Maximum permissible values	Current $\pm 50$ mA, voltage $\pm 25$ V
	Internal resistance	Current $R_i = 50 \Omega$ ; voltage $R_i = 20 \text{ k}\Omega$
	Permissible common mode voltage	0 to 5 V
	Fault	Zero $< 0.2 \%$ , span $< 0.2 \%$ , linearity $< 0.2 \%$
	Temperature influence	Zero $< 0.1 \%/10 \text{ K}$ ; span $< 0.1 \%/10 \text{ K}$
Transmitter supply		Acc. to DIN IEC 381 (NAMUR NE06) 20 V, max. 25 mA, resistant to short circuit
Temperature sensor	Measuring range	Pt 100, Pt 1000: $-100$ to $500 \text{ }^\circ\text{C}$ $-150$ to $930^\circ\text{F}$ Ni 100, Ni 1000: $-60$ to $250 \text{ }^\circ\text{C}$ $-75$ to $480^\circ\text{F}$
	Wire resistance	Three-wire $R_{L1} = R_{L2} = R_{L3} < 15 \Omega$
	Fault	Zero $< 0.2 \%$ , gain $< 0.2 \%$ linearity $< 0.2 \%$
	Temperature influence	Zero $< 0.2 \%/10 \text{ K}$ ; span $< 0.2 \%/10 \text{ K}$
Potentiometer	Measuring range	0 to $1 \text{ k}\Omega$ , three-wire
	Wire resistance	$R_L < 15 \Omega$ , respectively
	Fault	Zero $< 0.2 \%$ , gain $< 0.2 \%$
	Temperature influence	Zero $< 0.1 \%/10 \text{ K}$ ; gain $< 0.2 \%/10 \text{ K}$
Binary input		External switching voltage 24 V DC, $\pm 30 \%$
<b>Outputs</b>		Option of continuous-action, three-step or on-off output
Continuous- action output	Signal range	0(4) to 20 mA; load $< 740 \Omega$
	Control range	0 to 22 mA (0 to 110 %)
	Fault	Zero $< 0.2 \%$ , gain $< 0.1 \%$
	Temperature influence	Zero $< 0.1 \%/10 \text{ K}$ ; span $< 0.1 \%/10 \text{ K}$
Three-step/on-off output		2 relays with floating switching contact, max. 250V AC, max. 250 V DC, max. 1 A AC, max. 0.1 A DC, $\cos \theta = 1$
Binary output		Isolated transistor output, max. 50 V DC and 30 mA, min. 3 V DC
<b>General details</b>		
Display		4-digit liquid crystal display
Configuration		Function blocks stored in read-only memory for fixed set point and follow-up control
Power supply		230 V AC (200 to 250 V AC), 120 V AC (102 to 132 V AC), 24 V AC (21.5 to 26.5 V AC), 48 to 62 Hz
Power consumption		Approx. 6 VA
Temperature range		0 to $50 \text{ }^\circ\text{C}$ (32 to $120^\circ\text{F}$ ) operation, $-20$ to $70 \text{ }^\circ\text{C}$ ( $-4$ to $160^\circ\text{F}$ ) shipping and storage
Degree of protection		Front panel IP 65, housing IP 30, terminals IP 00
Device safety		Design and inspection acc. to EN 61010, edition 3.94
Class of protection		II
Overvoltage category		II
Degree of contamination		2
Noise emission		EN 50081 Part 1
Noise immunity		EN 50081 Part 2
Electrical connection	Supply voltage and process signals	Screw terminals $1.5 \text{ mm}^2$
Total delay time		200 ms ; sampling time $< 100 \text{ ms}$
Resolution		Input: $0.1 \text{ }^\circ\text{C}$ ; 0.1%
Dimensions		See dimension diagram
Weight		Approx. 0.5 kg (1.1 lb)

**Dimensions in mm (inch)**

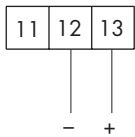
Panel cut-out  $45^{+0.6} \times 92^{+0.8}$  ( $1.77^{+0.023} \times 3.622^{+0.0315}$ )



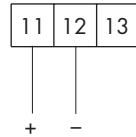
**Electrical connection**

**Input IN1**

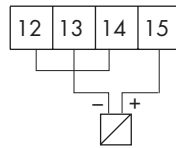
4(0) to 20 mA



0(2) to 10 V

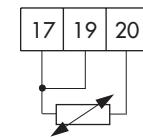


Two-wire transmitter  
4 to 20 mA

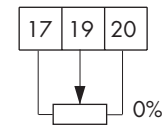


**Input IN2**

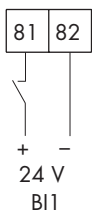
Pt100/Pt 1000  
Ni100/Ni1000



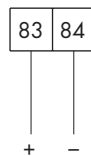
0 to 1kΩ



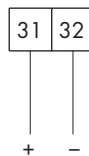
**Binary input**



**Binary output  
for alarm messages (AR)**



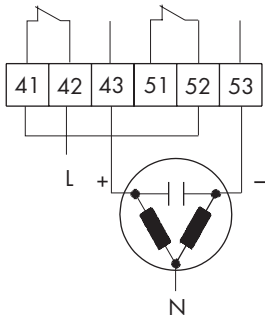
**Continuous-action output  
0(4) to 20 mA**



**Power supply**



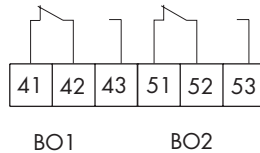
**Three-step output**



**On-off output**

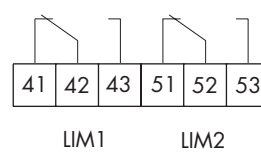


**Binary outputs**



Floating contacts

**Limit relays**



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