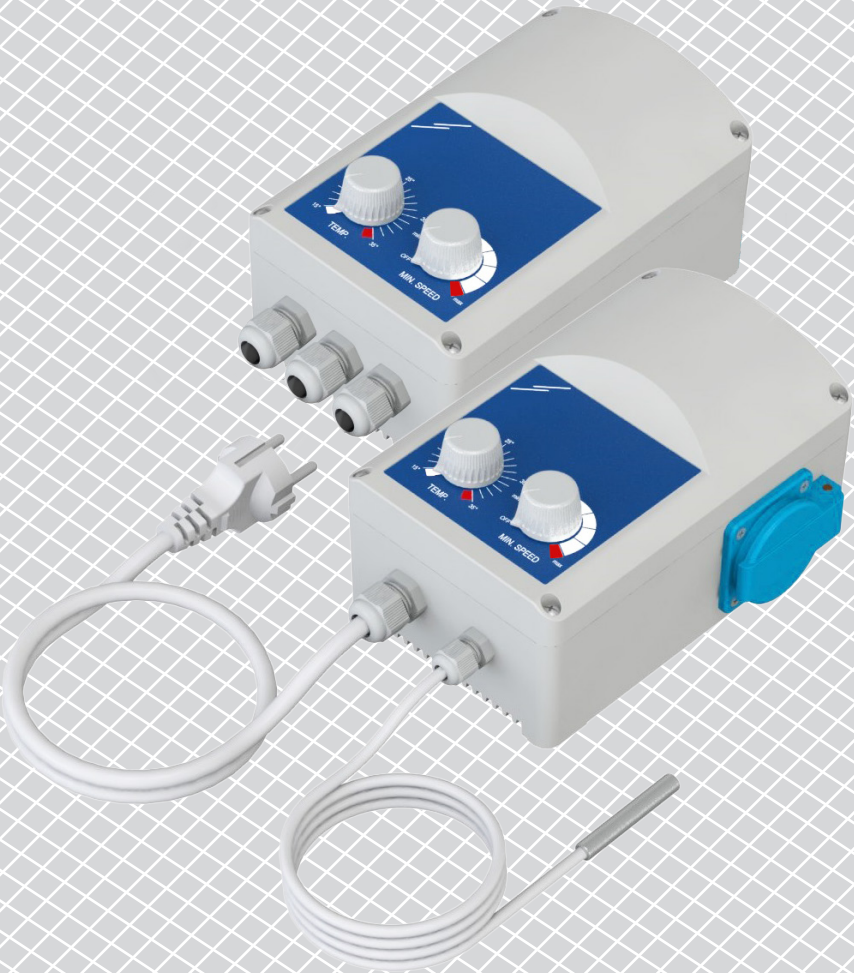
# GTEX1-60 | ELECTRONIC FAN SPEED CONTROLLER

## Mounting and operating instructions



# Table of contents

## SAFETY AND PRECAUTIONS

Read all the information, the datasheet, mounting and operating instructions and study the wiring and connection diagram before working with the product. For personal and equipment safety, and for optimum product performance, make sure you entirely understand the contents before installing, using, or maintaining this product.

For safety and licensing (CE) reasons, unauthorised conversion and / or modifications of the product are inadmissible.


The product should not be exposed to abnormal conditions, such as: extreme temperatures, direct sunlight or vibrations. Long-term exposure to chemical vapours in high concentration can affect the product performance. Make sure the work environment is as dry as possible; avoid condensation.

All installations shall comply with local health and safety regulations and local electrical standards and approved codes. This product can only be installed by an engineer or a technician who has expert knowledge of the product and safety precautions.

Avoid contacts with energised electrical parts. Always disconnect the power supply before connecting, servicing or repairing the product.

Always verify that you apply appropriate power supply to the product and use appropriate wire size and characteristics. Make sure that all the screws and nuts are well tightened and fuses (if any) are fitted well.

Recycling of equipment and packaging should be taken into consideration and these should be disposed of in accordance with local and national legislation / regulations.

In case there are any questions that are not answered, please contact your technical support or consult a professional.

## PRODUCT DESCRIPTION

The GTE fan speed controller automatically regulates the speed of single phase voltage controllable motors (230 VAC / 50—60 Hz) according to the measured temperature values. The maximum speed can be adjusted via an internal trimmer. The minimum speed and temperature setpoint can be adjusted via external potentiometers. There are two product versions: -DM with Modbus RTU communication and -DT with an integrated motor socket, power cable and a PT500 temperature probe. The fan speed will increase as the measured temperature exceeds the setpoint temperature.

## ARTICLE CODES

| Code | Temperature range | PT500 temperature sensor included | Schuko socket for simple motor connection | Integrated power supply cable | Modbus RTU |
|---|---|---|---|---|---|
| **GTE21-60-DM** | 5—35 °C | no | no | no | yes |
| **GTE21-60-DT** | 5—35 °C | yes | yes | yes | no |
| **GTE-1-60-DM** | 15—35 °C | no | no | no | yes |
| **GTE-1-60-DT** | 15—35 °C | yes | yes | yes | no |

## INTENDED AREA OF USE

- Greenhouses and temperature controlled ventilation systems
- For indoor use only

## TECHNICAL DATA

- Supply voltage: 230 VAC ±10 % / 50—60 Hz
- Output load: max. 6 A
- Potentiometer for minimum speed setting
- Internal trimmer for maximum speed setting
- Adjustable hysteresis and proportional range
- Potentiometer for temperature setpoint range: 5—35 °C or 15—35 °C, depending on the product version
- PT500 temperature probe input (pre-wired for the -DT version and separately available for the -DM version)
- Modbus RTU communication (only in -DM version)
- Schuko socket for motor connection (only in -DT version)
- Euro plug for power supply (only in -DT version)
- Pre-wired temperature sensor and supply cable (only in -DT version)
- Enclosure: plastic R-ABS, V; grey colour (RAL 7035)
- Protection standard: IP54 (according to EN 60529)
- Storage temperature: -40—50 °C
- Operating ambient conditions:
  - temperature: 0—40 °C
  - rel. humidity: <95 % rH (non-condensing)
- Storage temperature: -40—50 °C

## STANDARDS

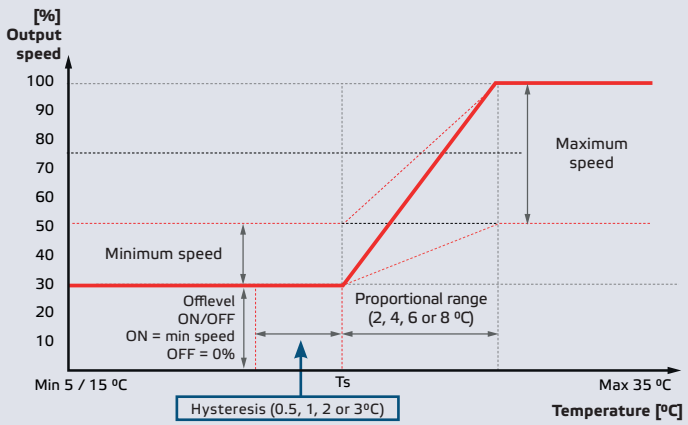
- Low Voltage Directive 2014/35/EC
- EMC Directive 2014/30/EC: EN 61000-3-2:2014, EN 61000-6-2:2005/ AC:2005 and EN 61000-6-3:2007/A1:2011/AC:2012
- WEEE Directive 2012/19/EC
- RoHs Directive 2011/65/EC

## WIRING AND CONNECTIONS

| GTEX1-60-DM | |
|---|---|
| L | Supply voltage 230 VAC / 50—60 Hz – mono phase ±10 % |
| N | Neutral |
| L1 | 230 VAC not regulated output (max. 2 A) |
| GND, T (TEMP.) | PT500 temperature sensor |
| A | RS485 signal A |
| /B | RS485 signal /B |
| P5 | Motor connection |
| **GTEX1-60-DT** | |
| L | Supply voltage 230 VAC / 50—60 Hz – mono phase ±10 % |
| N | Neutral |
| PE | Ground |
| L1 | 230 VAC not regulated output (max. 2 A) |
| GND, T (TEMP.) | PT500 temperature sensor |
| Schuko socket | Motor connection |

## OPERATIONAL DIAGRAM

**Control curve**

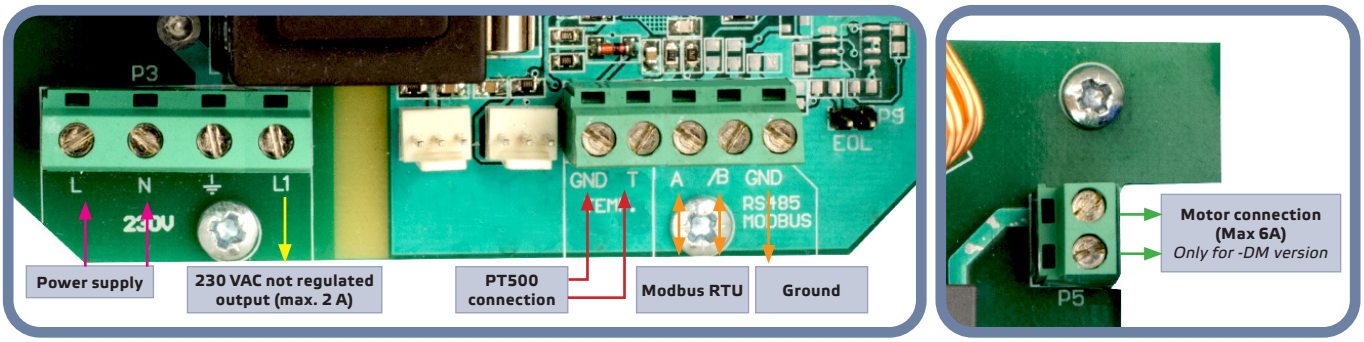


## MOUNTING INSTRUCTIONS IN STEPS

Before you start mounting the GTE controller, read carefully **"Safety and Precautions"**. Choose a flat surface for installation (e.g. a wall, panel, etc.) and follow these steps:

1. Insert the supply and sensor cables through the cable glands and do the wiring according to the information in section **"Wiring and connections"** while adhering to **Fig. 1** below.

**Fig. 1 Wiring diagram**




**NOTE**

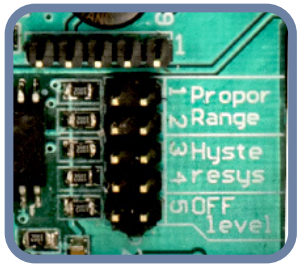
*For the -DT version the power supply and the temperature sensor (PT500) are included in the set and factory connected. Also, the -DT version has a Schuko socket to plug in the motor / fan. If your unit is -DT, please skip step 1.*

2. Fix the jumpers accordingly - see **Fig. 2** *Jumper positions* below**.**

**NOTE**

*The -DM version can be used both as a stand-alone unit or in conjunction with a computer and operated by Sentera's 3SModbus software or the Sensistant configurator. When used stand-alone, its jumpers need to be set to the desired values. When used in Modbus mode, its parameters are set via Modbus RTU, so the jumpers can remain in their factory set positions. Refer to the* **Modbus Holding Registers Table** *below for the relevant settings.*

**Fig. 2 Jumper positions**




| Propor. Range (JP1 & JP2) | |
|---|---|
| 1 ■■ 2 ■■ | 2 °C |
| 1 □□ 2 ■■ | 4 °C (factory preset) |
| 1 ■■ 2 □□ | 6 °C |
| 1 □□ 2 □□ | 8 °C |

| Hysteresis (JP3 & JP4) | |
|---|---|
| 3 ■■ 4 ■■ | 0,5 °C |
| 3 □□ 4 ■■ | 1 °C |
| 3 ■■ 4 □□ | 2 °C (factory preset) |
| 3 □□ 4 □□ | 3 °C |

| Off-level (JP5 & JP6) | |
|---|---|
| 5 ■■ | On |
| 5 □□ | Off (factory preset) |

**-DM version mounting steps:** *Go to -DT version ►*

1. Make sure the GTE controller is not connected to the mains supply.
2. Unscrew the front cover and open the enclosure. Mind the wires that connect the potentiometer with the printed circuit board.
3. Fix the unit to the wall or panel using the provided screws and dowels. Mind the correct mounting position and unit mounting dimensions. (See **Fig. 3** *Mounting dimensions* and **Fig. 4** *Mounting position*.).

**Fig. 3 Mounting dimensions**

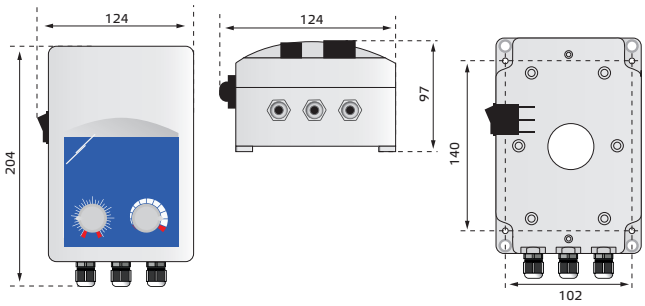
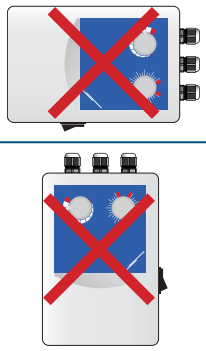
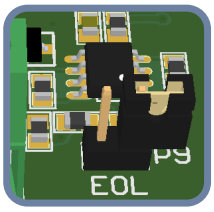



**Fig. 4 Mounting position**

| Correct | Incorrect |
|---|---|
|  |  |

4. Set the maximum speed trimmer to the desired value. You can choose from the range 170—230 VAC. The factory setting is 230 VAC.
5. ***Optional setting:***
   - The Network Bus Terminator (NBT) (see **Fig. 5** *NBT jumper*) used with Modbus RTU. By default the NBT is disconnected.

**Fig. 5 NBT jumper**



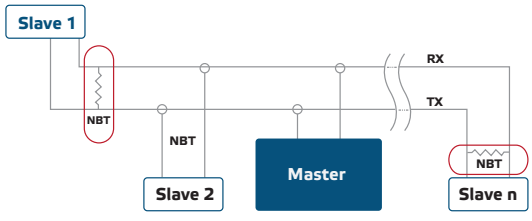

| | |
|---|---|
| ▬ | NBT is connected |
| □□ | NBT is disconnected (factory pre-set) |

**NOTE**

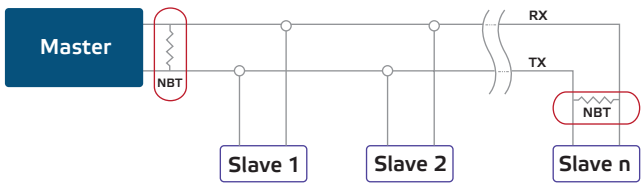
*Connect the NBT only in the two most distant units on the network line!*

- Connect the NBT by placing the jumper onto the pins as indicated above only if your unit starts or terminates the network. Skip this step if your unit is not the first or last on the network. See the examples below for more information.

**Example 1**




**Example 2**




6. Put back the front cover and fix it.

**-DT version mounting steps:** *Back to -DM version ►*

1. Make sure the GTE controller is not connected to the mains supply.
2. Unscrew the front cover and open the enclosure. Mind the wires that connect the potentiometer with the printed circuit board.
3. Fix the unit to the wall or panel using the provided screws and dowels. Mind the correct mounting position and unit mounting dimensions. (See **Fig. 6** *Mounting dimensions* and **Fig. 7** *Mounting position*.)

**Fig. 6 Mounting dimensions**

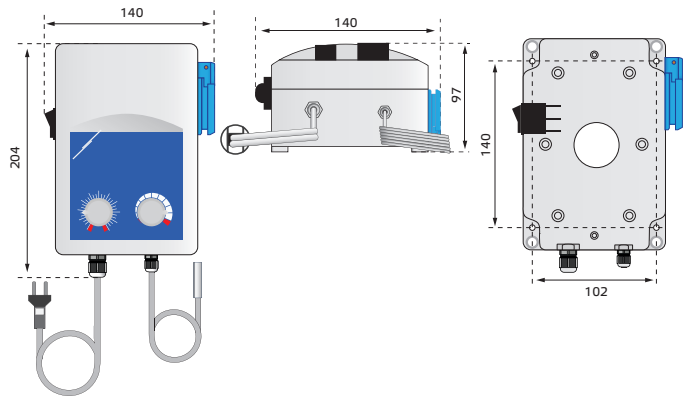
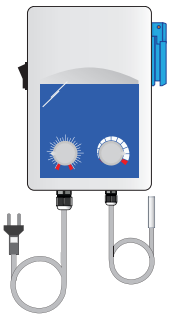
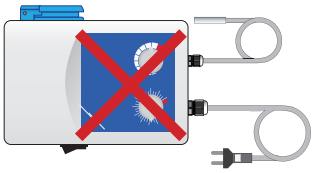
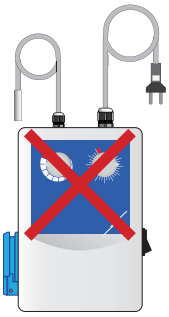
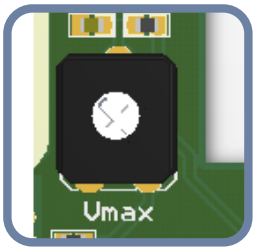



**Fig. 7 Mounting position**

| Correct | Incorrect |
|---|---|
|  |   |

4. Set the maximum speed trimmer to the desired value (see **Fig. 8 Max. speed trimmer** ). You can choose from the range 170—230 VAC. The factory setting is 230 VAC.

**Fig. 8 Max. speed trimmer**




Vmax set from 170 VAC (left) to 230 VAC (right) (factory pre-set to max.)

5. Put back the front cover and fix it.
6. Plug the motor / fan cable into the Schuko socket.

## VERIFICATION OF INSTALLATION INSTRUCTIONS

**⚠ ATTENTION**

*Use only tools and equipment with non-conducting handles when working on electrical devices..*

1. Plug in the supply cable.
2. Switch on the controller via the illuminated ON/OFF switch.
3. Position the TEMP. potentiometer to max. position (35 ºC). (See **Fig. 9 -DM version** and **Fig. 10 -DT version**)

**Fig. 9 -DM version**

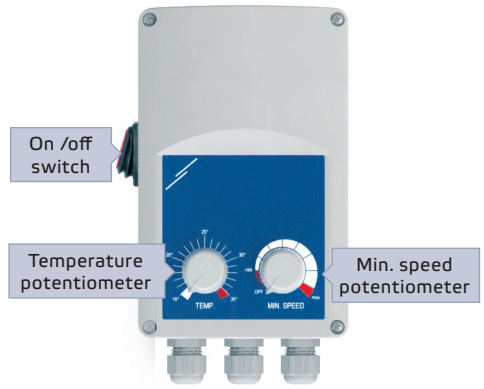
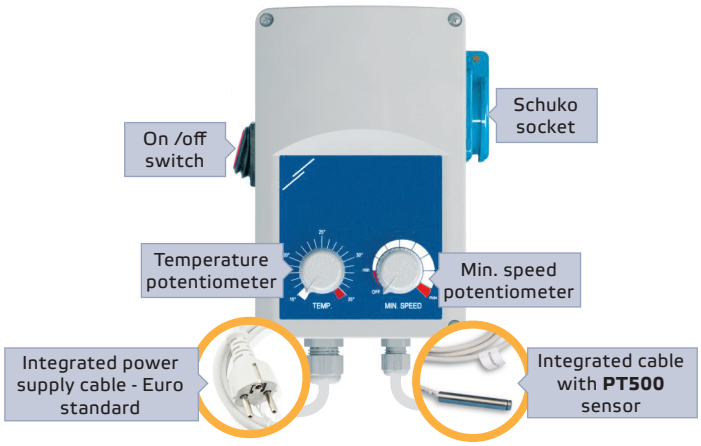



**Fig. 10 -DT version**




4. The connected motor will run at min. speed.
5. Adjust the TEMP. potentiometer to temperature equal to the ambient temperature.
6. The motor / fan will run at min. speed and speed up if the ambient temperature rises (hold the temperature probe in your hands to check).
7. Adjust the temperature potentiometer to the min. position (5 ºC for GTE21-60-DM and GTE21-60-DT or 15 ºC for GTE-1-60-DM and GTE-1-60-DT)
8. The motor will run at max. selected speed if the difference between the setpoint temperature and the ambient temperature is more than the value of the selected proportional range.
9. If the unit does not operate as explained above, check the connections and settings.

## MODBUS REGISTERS MAPS

**INPUT REGISTERS (Read-only)**

| | | Data type | Description | Data | | Values | |
|---|---|---|---|---|---|---|---|
| 1 | Temperature input | unsigned int. | Analog temperature input | 0—600 | | 0 =<br>600 = | 0,0 ºC<br>60.0 ºC |
| 2 | Vmax | unsigned int. | Max. motor speed value | 170—230 | | 170 =<br>230 = | 170 VAC<br>230 VAC |
| 3 | Vmin | unsigned int. | Min. motor speed value | 80—160 | | 80 =<br>160 = | 80 VAC<br>160 VAC |
| 4 | Output voltage | unsigned int. | Current output voltage | 0,80—230 | | 0 =<br>80 =<br>230 = | 0 VAC<br>80 VAC<br>230 VAC |
| 5 | Temperature setpoint | unsigned int. | Temperature setpoint value | GTE21-60-DM<br>GTE-1-60-DM | 50—350<br>150—350 | 50 =<br>150 =<br>350 = | 5,0 ºC<br>15,0 ºC<br>35,0 ºC |
| 6 | Proportional range | unsigned int. | Proportional temperature value | 1—4 | | 1 =<br>2 =<br>3 =<br>4 = | 2 ºC<br>4 ºC<br>6 ºC<br>8 ºC |
| 7 | Hysterisis | unsigned int. | Hysterisis value | 1—4 | | 1 =<br>2 =<br>3 =<br>4 = | 0,5 ºC<br>1 ºC<br>2 ºC<br>3 ºC |
| 8 | Off level | unsigned int. | Off level value | 0, 1 | | 0 =<br>1 = | OFF<br>ON |
| 9 | Sensor status | unsigned int. | Input sensor status | 0, 1 | | 0 =<br>1 = | sensor connected<br>sensor disconnected |
| 10 | | | Reserved, Returns '0' | | | | |

**Note:** The input registers can be read via the Modbus command: "Read input registers".

**HOLDING REGISTERS (Read/write)**

| | | Data type | Description | Data | Default | Values | |
|---|---|---|---|---|---|---|---|
| 1 | Address | unsigned int. | Modbus device address | 1—247 | 1 | | |
| 2 | Modbus baud rate | unsigned int. | Modbus communication baud rate | 1—4 | 2 | 1 =<br>2 =<br>3 =<br>4 = | 9.600<br>19.200<br>38.400<br>57.600 |
| 3 | Modbus parity mode | unsigned int. | Parity check mode | 0—2 | 1 | 0 =<br>1 =<br>2 = | 8N1<br>8E1<br>8O1 |
| 4 | Device type | unsigned int. | Device type (Read only) | GTE21-60-DM=3013<br>GTE-1-60-DM=3003 | | | |
| 5 | HW version | unsigned int. | Hardware version of the device (Read only) | XXXX | GTE21-60-DM<br>GTE-1-60-DM | 0x0210 =<br>0x0200 = | HW version 2.10<br>HW version 2.00 |
| 6 | SW version | unsigned int. | Software version of the device (Read only) | XXXX | GTE21-60-DM | 0x0300 = | SW version 3.00 |
| | | | | | GTE-1-60-DM | 0x0230 = | SW version 2.30 |
| 7 | Operating mode | unsigned int. | Mode of operation | 0—1 | 0 | 0 =<br>1 = | Standalone mode<br>Modbus mode |
| 8 | Output overwrite | unsigned int. | Output overwrite mode | 0—1 | 0 | 0 =<br>1 = | Disabled<br>Enabled |
| 9-10 | | | Reserved, return '0' | | | | |
| 11 | Vmax | unsigned int. | Max. motor speed value | 170—230 | 230 | 170 =<br>230 = | 170 VAC<br>230 VAC |
| 12 | Vmin | unsigned int. | Min. motor speed value | 80—160 | 80 | 80 =<br>160 = | 80 VAC<br>160 VAC |
| 13 | Temperature setpoint | unsigned int. | Temperature setpoint value | GTE21-60-DM: 50—350<br>GTE-1-60-DM: 150—350 | 150 | 50 =<br>150 =<br>350 = | 5,0 ºC<br>15,0 ºC<br>35,0 ºC |
| 14 | Proportional range | unsigned int. | Proportional range value | 1—4 | 2 | 1 =<br>2 =<br>3 =<br>4 = | 2 ºC<br>4 ºC<br>6 ºC<br>8 ºC |
| 15 | Hysterisis | unsigned int. | Hysterisis value | 1—4 | 3 | 1 =<br>2 =<br>3 =<br>4 = | 0,5 ºC<br>1 ºC<br>2 ºC<br>3 ºC |
| 16 | Off level | unsigned int. | Off level value | 0—1 | 0 | 0 =<br>1 = | OFF<br>ON |
| 17 | Modbus time-out control | unsigned int. | Modbus time-out control value | 0—1 | 0 | 0 =<br>1 = | Disabled<br>Enabled |
| 18 | Modbust time-out | unsigned int. | Modbus time-out value | 0—60 | 1 | 1 =<br>60 = | 1 min<br>60 min. |
| 19 | Vout | unsigned int. | Set override output voltage | 0,80—230 | 0 | 0 =<br>80 =<br>230 = | 0 VAC<br>80 VAC<br>230 VAC |
| 20 | | | Reserved, returns '0' | | | | |

Note: The holding registers can be managed via the following Modbus commands: "Read Holding Registers", "Write Single Register" or "Write Multiple Registers".

If you want to find out more about Modbus over serial line, please visit: *http://www.modbus.org/docs/Modbus_over_serial_line_V1_02.pdf*

## TRANSPORT AND STORAGE

Avoid shocks and extreme conditions; stock in the original packing.

## WARRANTY AND RESTRICTIONS

Two years from the delivery date against defects in manufacturing. Any modifications or alterations to the product after the date of publication relieve the manufacturer of any responsibilities. The manufacturer bears no responsibility for any misprints or mistakes in this data.

**⚠ ATTENTION**

*Use only fuses of the type and rating specified above; otherwise, loss of warranty will ensue.*

## MAINTENANCE

In normal conditions this product is maintenance-free. If soiled, clean with a dry or damp cloth. In case of heavy pollution, clean with a non-aggressive product. In these circumstances the unit should be disconnected from the supply. Pay attention that no fluids enter the unit. Only reconnect it to the supply when it is completely dry.