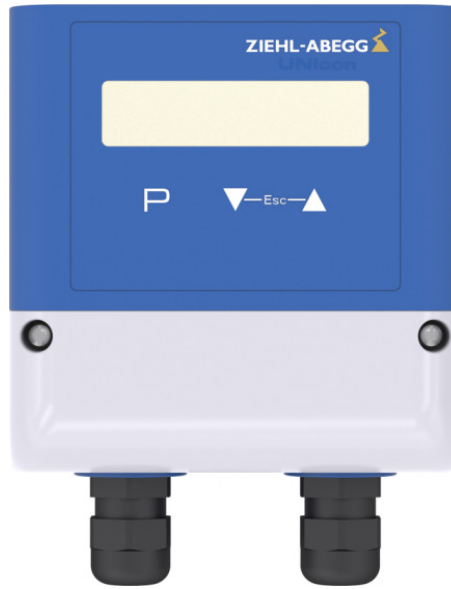
english

# UNIcon

## CTG-150AV

### Temperature-control module

#### Operating Instructions




**Keep for reference!**

L-BAL-E258-GB 1912 Index 003

ZIEHL-ABEGG

# Content

# 1 General notes

Compliance with the following instructions is mandatory to ensure the functionality and safety of the product. If the following instructions given especially but not limited for general safety, transport, storage, mounting, operating conditions, start-up, maintenance, repair, cleaning and disposal / recycling are not observed, the product may not operate safely and may cause a hazard to the life and limb of users and third parties. Deviations from the following requirements may therefore lead both to the loss of the statutory material defect liability rights and to the liability of the buyer for the product that has become unsafe due to the deviation from the specifications.

## 1.1 Structure of the operating instructions

Before installation and start-up, read this manual carefully to ensure correct use!
We emphasize that these operating instructions apply to specific units only, and are in no way valid for the complete system!
Use these operating instructions to work safely with and on the device. They contain safety instructions that must be complied with as well as information that is required for failure-free operation of the device.
Keep these operating instructions together with the device. It must be ensured that all persons that are to work on the device can refer to the operating instructions at any time.

## 1.2 Exclusion of liability

To allow for future developments, construction methods and technical data given are subject to alteration. We do not accept any liability for possible errors or omissions in the information contained in data, illustrations or drawings provided.
We accept no liability for damage caused by misuse, incorrect use, improper use or as a consequence of unauthorized repairs or modifications.

# 2 Safety instructions

- Mounting, electrical connection, and start-up operation may only be carried out by an electrical specialist in accordance with electrotechnical regulations (e.g. DIN EN 50110 or DIN EN 60204)!
- Persons entrusted with the planning, installation, commissioning and maintenance and servicing in connection with the device must have the corresponding qualifications and skills for these jobs. In addition, they must be knowledgeable about the safety regulations, EU directives, rules for the prevention of accidents and the corresponding national as well as regional and in-house regulations.
- The equipment is to be used solely for the purposes specified and confirmed in the order. Other uses which do not coincide with, or which exceed those specified will be deemed unauthorised unless contractually agreed. Damages resulting from such unauthorised uses will not be the liability of the manufacturer. The user will assume sole liability.
- It is strictly forbidden for work to be carried out on any components while they are connected to live voltage.

- The safe isolation from the supply must be checked using a two-pole voltage detector.
- The owner is obliged to ensure that the device is operated in perfect working order only.
- Electrical equipment must be checked regularly: Loose connections are to be re-tightened and damaged lines or cables must be replaced immediately.
- Never clean electrical equipment with water or similar liquids.
- A separate fault and performance monitoring-system with an alarm signal function is necessary in order to prevent personal injuries and material damages during malfunctions and in case the device fails. Substitute operation must be taken into consideration!

# 3 Product overview

## 3.1 Operational area

Temperature control for e.g.: extraction systems, warm-air heaters, air curtain installations, liquid-cooling, chillers.
Controlled output (0 - 10 V) e.g. for activating a speed controller for fans.
Fans with integrated controller and input 0 - 10 V can be activated directly.

## 3.2 Function

The measured actual value at the sensor is compared with the adjusted target value. Output voltage and thus fan speed is controlled automatically depending on the adjusted parameters.
Alternatively the device can be operated as temperature sensor. Output 0 - 10 V in this mode proportional to the adjusted measuring range (max. -50...150 °C).

## 3.3 Storage

- The device must be stored in its original packaging in a dry and weather-proof room.
- Avoid exposure to extreme heat and cold.
- Avoid over-long storage periods (we recommend a maximum of one year).

## 3.4 Disposal / recycling

Disposal must be carried out professionally and in an environmentally friendly way in accordance with the respective national legal stipulations.
▷ Separate the materials by type and in an environmentally friendly way.
▷ If necessary, commission a specialist company with the waste disposal.

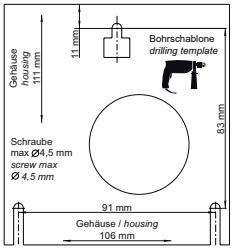
# 4 Mounting

## 4.1 General notes

**Attention!**

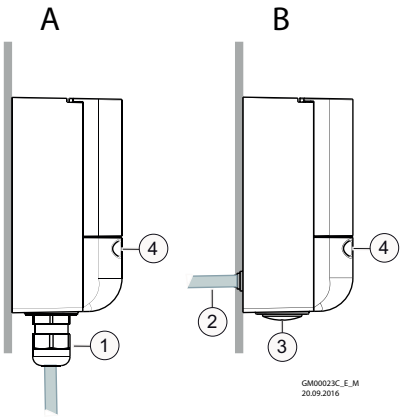
- Before installation remove the device from the packing and check for any possible shipping damage! Start-up is not allowed in the case of transport damage!
- Do not mount equipment on vibrating base!
- When mounted onto lightweight walls, there must be no impermissibly high vibrations or shock loads. Any banging shut of doors that are integrated into these lightweight walls, can result in extremely high shock loads. Therefore, we advise you to decouple the devices from the wall.
- Do not allow drilling chips, screws and other foreign bodies to reach the device interior!
- The device should be installed in a location where it will not be disturbed, but at the same time can be easily accessed!
- Care must be taken to avoid direct radiation from the sun!
- The device is designed for vertical installation (bottom cable inlet). A horizontal or reclined installation is only permissible after technical release of the manufacturer!
- Remove the connection cover for mounting and connection, and subsequently close it again carefully.
- Use the templates printed on the device packing to mark the fastening bore holes.

Drilling template on packing




- Assemble the device on a clean and stable base. Do not distort during assembly! Use the appropriate mounting devices for proper installation of the unit!
- Housing versions
  - "A": cable inlet via cable glands on the bottom side of the device
  - "B": cable inlet via stepped grommets at the rear side of the device

Vertical mounting




*1 Bottom cable inlet*
*2 Cable inlet at the back*
*3 Locking screws*
*4 Lid screw (tightening torque 1.1 Nm)*

### 4.2 Installation location for agriculture

When using for animal keeping, do not install the device directly in the stable but in a separate room with a lower pollutant load. This helps to avoid damages caused by pollutant gases (e.g. ammonia fumes, hydrogen sulphide fumes).

## 5 Electrical installation

### 5.1 EMC-compatible installation of control lines

Pay attention to maintain sufficient distance from powerlines and motor wires to prevent interferences.
When using a shielded cable the shield must be connected (as short and with as low an induction as possible!) to the PE conductor on one side at the signal input (of the evaluation unit).

### 5.2 Connection Voltage supply

Connection Voltage supply at terminals: “+$U_S$” and “GND”. Here, it must be strictly observedt hat the mains voltage lies within the llowable olerance pecifications (see Technical data and nameplate affixed to the side).

**Danger due to electric current**
Only PELV current sources which ensure safe electrical isolation of the operating voltage in accordance with IEC/DIN EN 60204-1 must be used.
There is no potential isolation between supply voltage and output signal.

## 5.3 Sensor connection

Connection of temperature sensor for measuring actual value (not in scope of delivery) to terminals “TF”. It is possible to connect ZIEHL-ABEGG sensors of series “TF..” (KTY81-210) or PT1000 temperature sensors (it must be paid attention to no polarity). For a high interference immunity a capacitor must be connected directly to the sensor (1 nF parallel). With ZIEHL-ABEGG temperature sensors type TF.. (KTY81-210) a capacitor is integrated.

**Attention!**
Never apply line voltage to analog inputs!

ZIEHL-ABEGG temperature sensors type series “TF..” (further information see Main Catalogue Control Technology)

| | | | | | |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| Built in sensor for direct measurement at the device<br>Type: TFR-E<br>Part.-No.: 00153406 | Room sensor, outdoor sensor<br>Type: TFR<br>Part.-No.: 00089846 | Immersion sensor<br>Type: TFT<br>Part.-No.: 00154797 | Contact sensor<br>Type: TFA<br>Part.-No.: 00153407 | Living room sensor<br>Type: TFW<br>Part.- No. 00154798 | Air duct sensor<br>Type: TFK<br>Part.-No.: 384022 |

## 5.4 Output voltage 0...10 V

Connection to terminals “A” and “GND” ($I_{max}$ see Technical data).

**Parallel control of several speed controllers / EC-fans**
The maximum possible number of speed controllers / EC fans with 0...10 V input that can be controlled parallel depends on their input resistance and on the maximum admissible load of the 0...10 V output.

**Example:**

- Supply voltage CPG / CTG: 10 V => $I_{max}$ for 0...10 V output = **0.3 mA** (see Technical data or connection diagram).
- ECblue motor size B: Input resistance $R_i$ > **100 kΩ** (Assembly instuctions fan seeTechnical data or connection diagram).
- The current consumption for one fan is max. **0.1 mA** (I = U / R = 10 V / 100 kΩ)

✓ **Result:**
A maximum of **three** ECblue motor size B can be operated in parallel at one CPG / CTG (total current consumption ≤ $I_{max}$ 0...10 V output CPG / CTG).

**Attention!**

- It is not permissible to connect outputs of several devices to each other!
- In case of failure of the control module or interruption of the 0...10 V specification signal, all parallel connected EC fans/speed controllers are no longer controlled. This means that all fans stop!

## 5.5 Input for switch over Setpoint 1 / Setpoint 2

Via voltage at terminals “1” and “2” (10... 24 V DC) a switchover between Setpoint 1 and Setpoint 2 is possible (note polarity see connection diagram).

- Voltage OFF => Setting “Setpoint 1” active
- Voltage ON => Setting “Setpoint 2” active

Setpoint 1active

| |
|---|
| 20.0 °C<br>Setpoint 1 |

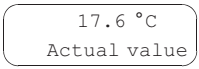
The active Setpoint is indicated in the menu INFO, an active “Setpoint 2” is signalized by the moon symbol.

Setpoint 2 active

| |
|---|
| 15.0 °C<br>Setpoint 2 ☾ |

-

# 6 Multipurpose LC display and keyboard




Line 1: 16 figures for actual and desired values
Line 2: 16 figures for menu text


| | |
|---|---|
| **P** | Program key and open menu |
| ▼ | Menu selection, reduce value |
| ▲ | Menu selection, increase value |
| ▼ + ▲ | ESC-key combination, Escape = leave menu |

### Messages on the display

| | |
|---|---|
| ! | Exceeding measuring range |
| ☾ | Moon symbol = Adjustment for Setpoint 2 active |

# 7 Programming

## 7.1 Select operation mode

**Information**
Simple installation is possible through the selection of the preprogrammed mode of operation.
This determines the basic function of the device, factory set **2.01**.

| Mode | Function |
|---|---|
| **2.00** | Temperature sensor: output 0...10 V proportional to measuring range |
| **2.01** | Temperature controller (P): output 0...10 V depending on adjusted Setpoint an measured Actual value (**Factory setting**) |

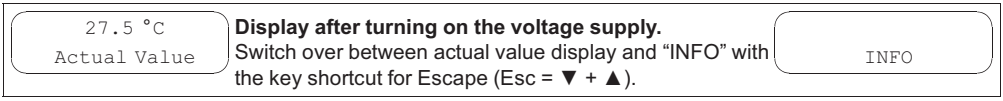
## 7.2 Start up

**Procedure**

1. You must mount and connect the device in accordance with the operating instructions.
2. Double check that all connections are correct.
3. The supply voltage must match the information on the rating plate.
4. Set the mode, unit and measuring range and adjust the sensor in the **BASE SETUP**.
5. Set the parameters for control operation for the mode **2.01** under **SETTING**.

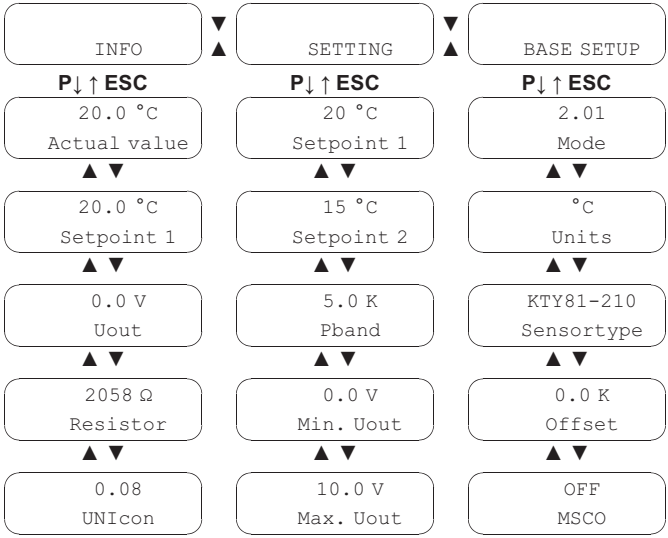
**Information**
When saving the operating Mode, the factory settings are stored. Therefore all the settings you have made before, are lost.

## 7.3 Menu structure

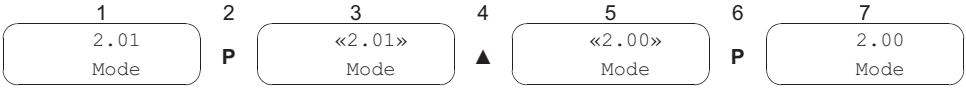



Selection of the menu group (e.g. BASE SETUP) to the right through the ▼-key, to the left through the ▲-key.
Youcangotothemenuitemsinthe**menu**groups (e.g. mode) by using the P key. Use the arrow keys to move up and down within the menu group.
To make adjustments, press the **P** key after selecting the menu item. If the previously set value starts to flash, it can be adjusted with the ▼+▲ keys and then saved with the **P** key. To exit the menu without making any changes, use the “Esc” short-key, i.e., the originally set values remain.

**Example for Mode 2.01 (Factory setting)**




**Reprogramming Mode 2.01 to 2.00 in "BASE SETUP"**




## 7.4 Display unit °C or °F

The display can be switched between SI units "°C" (factory setting) and imperial units (US) "°F" see BASE SETUP / Units.

| Conversion factor: t / °F = 1.8 x t °C + 32 |
|---|

Settings for temperature differences (with SI units in K) are also made for Imperial units (US) in °F ( Δ 1.8 °F ≙ Δ 1 K ).

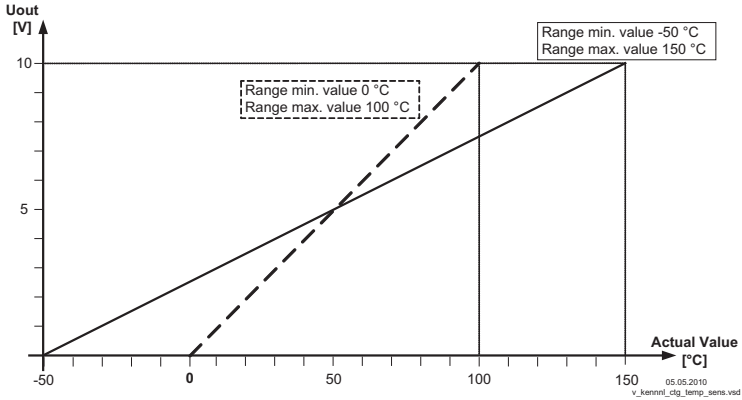
## 7.5 Parameter table

| Parameter | Factory setting | | User Setting | Function |
|---|---|---|---|---|
| Mode | **2.00** | **2.01** | | Mode |
| | | | | |
| **INFO** | | | | |
| Actual Value | 27.1 °C *(80.8 °F)* | 27.1 °C *(80.8 °F)* | | Display actual temperature |
| Setpoint 1 | - | 20.0 °C *(68.0 °F)* | | Display active Setpoint |
| Uout | 5.0 V | 5.0 V | | Magnitude of the output voltage 0...10 V |
| Resistor | 2049 Ω | 2049 Ω | | current resistance value of the temperature sensor |
| XXX | 1.00 | 1.00 | | Software version |
| **SETTING** | | | | |
| Setpoint 1 | - | 20.0 °C *(68.0 °F)* | | Setpoint1<br>Setting range:<br>-50.0...150.0 °C *(-58.0...302.0 °F)*<br>Factory setting:<br>20.0 °C *(68.0 °F)* |
| Setpoint 2 | - | 15.0 °C *(59.0 °F)* | | Setpoint 2 active, if voltage at terminals 1, 2<br>Setting range:<br>-50.0...150.0 °C *(-58.0...302.0 °F)*<br>Factory setting:<br>15.0 °C *(59.0 °F)* |
| Pband | - | 5.0 K *(9.0 °F)* | | Pband<br>Setting range:<br>1.0...50.0 K *(1.8...90.0 °F)*<br>Factory setting:<br>5.0 K *(9.0 °F)* |
| Min. Uout | 0.0 V | 0.0 V | | Setting minimal output voltage |
| Max. Uout | 10.0 V | 10.0 V | | Setting maximal output voltage |
| **BASE SETUP** | | | | |
| Mode | **2.00** | **2.01** | | **Mode selection** |
| Units | °C | °C | | Setting range: °C / °F |
| Sensortype | KTY81-210 | KTY81-210 | | Setting type of sensor: KTY81-210 or PT1000 |
| Range min. Temperature | -50.0 °C *(-58.0 °F)* | - | | Setting measuring range, minimum temperature value<br>Setting range:<br>-50.0...150.0 °C *(-58.0...302.0 °F)*<br>Factory setting:<br>-50.0 °C *(-58.0 °F)* |

| Parameter | Factory setting | | User Setting | Function |
|---|---|---|---|---|
| Range max. Temperature | 150.0 °C *(302.0 °F)* | - | | Setting measuring range, maximum temperature value<br>Setting range:<br>150...-50 °C *(302.0...-58.0 °F)*<br>Factory setting:<br>150.0 °C *(302.0 °F)* |
| Offset | 0.0 K *(0.0 °F)* | 0.0 K *(0.0 °F)* | | Sensor offset |
| MSCO | - | OFF | | Minimum speed cut off<br>MSCO: OFF (factory setting)<br>If “Min. Uout” is adjusted (e.g. 2.0 V), than no diconnection of the output takes place (does not go under “Min. Uout)”.<br>MSCO: -2.0 K (example)<br>It takes place a disconnection from Setting “Min. Uout” to “0”, if the given difference is reached related to the Setpoint.<br>At a plus value (+) before reaching the desired value.<br>At a minus value (-) after falling below the desired value.<br>Hysteresis H ON /OFF: approx. 1 K*(1.8 °F)*<br>Setting range:<br>-18.0 K...+18.0 K *(-34.4...+32.4 °F)* |
| Value>Set = n+ | - | ON | | Controller function<br>Value>Set = n+: ON Cooling = increasing modulation for increasing actual value over Setpoint.<br>Value>Set = n+: OFF Heating = increasing modulation for decreasing actual value below Setpoint. |

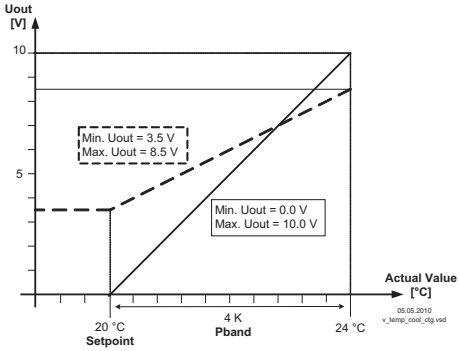
- *Parameter for selected mode not available*

## 7.6 Characteristic curve temperature sensor 2.00

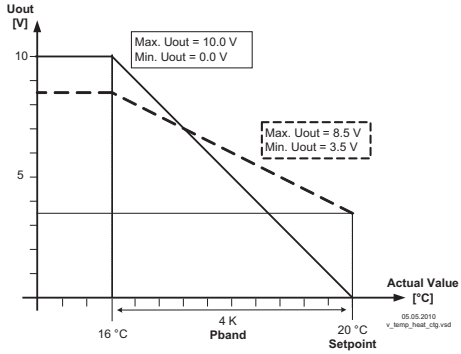


## 7.7 Function diagrams temperature controller 2.01

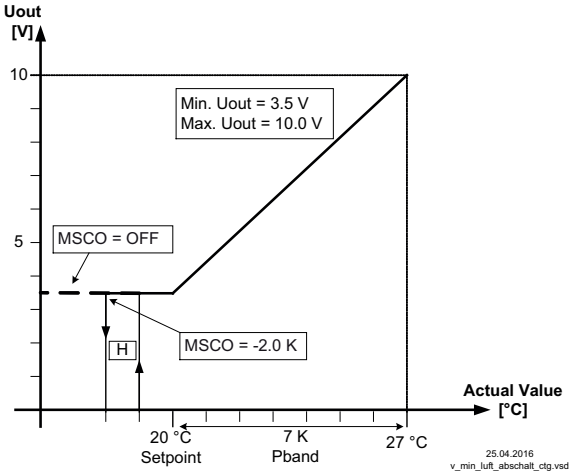
Cooling: Value>Set = n+: ON




Heating: Value>Set = n+: OFF




Minimum speed cut off



# 8 Enclosure

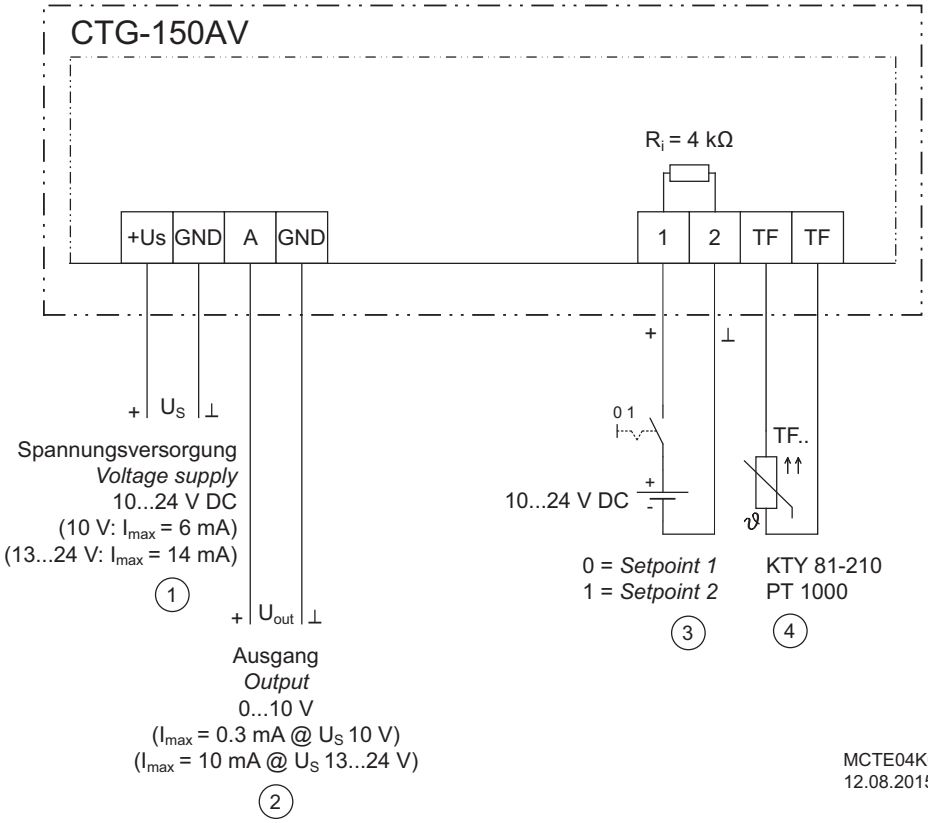
## 8.1 Technical data

| | |
|---|---|
| Type | CTG-150AV |
| Version:<br>Bottom cable inlet<br>Cable inlet at the back | Part No.:<br>320073<br>320081 |
| Measuring range | with temperature sensor KTY 81-210 or PT 1000<br>-50...150 °C *(-58...302 °F)* |
| Voltage supply $U_S$ | 10...24 V DC (+20 %)<br>Protected against reverse polarity |

| | @ $U_S$ 10 V DC | @ $U_S$ 13...24 V DC |
|---|---|---|
| Max. load output 0...10 V<br>(short-circuit-proof) | 0.3 mA | 10 mA |
| Max. current consumption ca. | 6 mA | 14 mA |

| | |
|---|---|
| Housing | PC (polycarbonate)<br>Fire protection classification UL94V0 |
| Protection rating | IP54 according EN 60529 |
| Weight | approx. 210 g *(0.46 lb)* |
| Permissible temperature range for operation | -10...60 °C *(14...140 °F)* |
| Permissible temperature range for storage and transport | -30...70 °C *(-22...158 °F)* |
| Permissible rel. humidity | 85 % no condensation |
| Maximum cross section of terminals | 1.5 $mm^2$ / AWG16 |
| Interference emission | according EN 61000-6-3 (domestic household applications) |
| Interference immunity | according EN 61000-6-2 (industrial applications) |

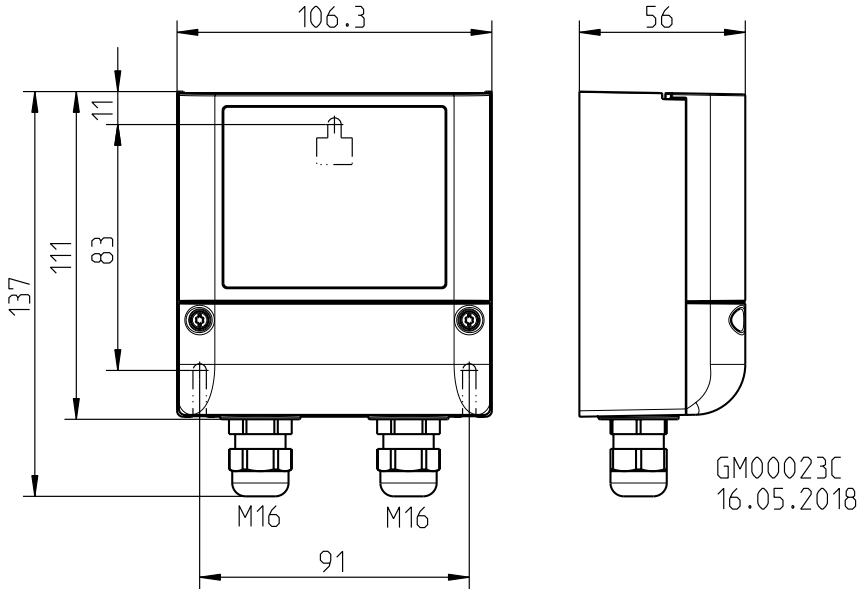
## 8.2 Connection diagram



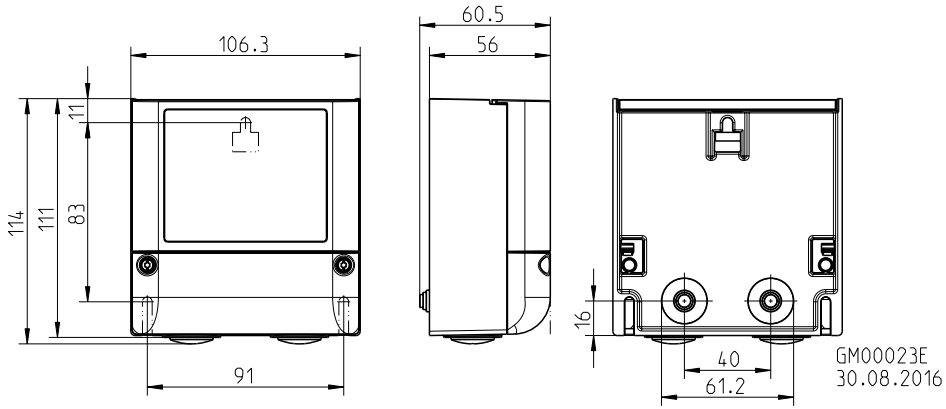

*1 Voltage supply 10...24 V DC*
*2 Output 0...10 V*
*3 Voltage input for switch over Setpoint 1 / Setpoint 2*
*4 Temperature sensor KTY 81-210 or PT 1000*

## 8.3 Dimensions [mm]

Version bottom cable inlet




Version cable inlet at the back



## 8.4 Manufacturer reference CE

Our products are manufactured in accordance with the relevant international regulations. If you have any questions concerning the use of our products or plan special uses, please contact:

**ZIEHL-ABEGG SE**
**Heinz-Ziehl-Straße**
**74653 Künzelsau**
**Telephone: +49 (0) 7940 16-0**
**Telefax: +49 (0) 7940 16-504**
**info@ziehl-abegg.de**
**http://www.ziehl-abegg.de**

## 8.5 Service information

If you have any technical questions while commissioning or regarding malfunctions, please contact our technical support for control systems - ventilation technology.
**phone: +49 (0) 7940 16-800**
**Email: fan-controls-service@ziehl-abegg.de**

Our worldwide contacts are available in our subsidiaries for deliveries outside of Germany, see www.ziehl-abegg.com.