

Electronic Temperature Controller

MCU1000EX

  II 3 G Ex ec nC IIC T4 Gc

Instruction Manual
Version 1.01.02



**Dear Customer,**

Thank you for buying our product. In this manual you will find all necessary information about this M&C product. The information in the manual is fast and easy to find, so you can start using your M&C product right after you have read the manual.

If you have any question regarding the product or the application, please don't hesitate to contact M&C or your M&C authorized distributor. You will find all the addresses in the appendix of this instruction manual.

For additional information about our products, please go to M&C's website www.mc-techgroup.com. There you can find the data sheets and manuals of our products in German and English.

This Operating Manual does not claim completeness and may be subject to technical modifications.

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With the release of this version all older manual versions will no longer be valid. The German instruction manual is the original instruction manual. In case of arbitration only the German wording shall be valid and binding.

Version: 1.01.02

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1 GENERAL INFORMATION

The product described in this instruction manual has been built and tested in our production facility.

All M&C products are packed to be shipped safely. To ensure the safe operation and to maintain the safe condition, all instructions and regulations stated in this instruction manual need to be followed. This instruction manual includes all information regarding proper transportation, storage, installation, operation and maintenance of this product by qualified personnel.

Follow all instructions and warnings closely. Read this manual carefully before commissioning and operating the device. If you have any questions regarding the product or the application, please don't hesitate to contact M&C or your M&C authorized distributor.

2 DECLARATION OF CONFORMITY



The product described in this operating manual complies with the following EU directives:

ATEX-Directive

The product described in this manual is produced in accordance with the EU directive for devices and protection systems for appropriate use in hazardous areas 2014/34/EU Annex II.

EMC Directive

The requirements of the EU directive 2014/30/EU "Electromagnetic compatibility" are met.

Low Voltage Directive

The requirement of the EU directive 2014/35/EU "Low Voltage Directive" are met.
The compliance with this EU directive has been examined according to DIN EN 61010.

RoHS Directive

The requirements of the RoHS2 ("Restriction of Hazardous Substances 2") directive 2011/65/EU and its annexes are met.

Declaration of Conformity

The EU Declaration of conformity can be downloaded from the **M&C** homepage or directly requested from **M&C**.



3 WARRANTY

In case of a device failure, please contact immediately M&C or your M&C authorized distributor.

We have a warranty period of 12 months from the delivery date. The warranty covers only appropriately used products and does not cover the consumable parts. Please find the complete warranty conditions in our terms and conditions.

The warranty includes a free-of-charge repair in our production facility or the free replacement of the device. If you return a device to M&C, please be sure that it is properly packaged and shipped with protective packaging. The repaired or replaced device will be shipped free of delivery charges to the point of use.

4 USED TERMS AND SIGNAL INDICATIONS



Danger

This means that death, severe physical injuries and/or important material damages **will occur** in case the respective safety measures are not fulfilled.



Warning

This means that death, severe physical injuries and/or important material damages **may occur** in case the respective safety measures are not fulfilled.



Caution

This means that minor physical injuries **may occur** in case the respective safety measures are not fulfilled.

Caution

Without the warning triangle means that a material damage may occur in case the respective safety measures are not met.



Note

These are important information about the product or parts of the operating manual which require user's attention.

Qualified personnel

These are persons who are familiar with the installation, commissioning, maintenance and operation of the product and have the necessary qualifications through training or instruction. Qualified personnel must have at least the following knowledge:

- Instructed person in EX-protection
- Trained person in the electrotechnical field

Detailed knowledge of the operating instructions and the applicable safety regulations.



'EX' indicates important information about the product or about the corresponding parts in the instruction manual, relating to usage in potentially explosive atmospheres.



High voltages!
Protect yourself and others against damages which might be caused by high voltages.

5 SAFETY INSTRUCTIONS

Follow these safety precautions during installation, commissioning and operation of the device:

- Read this operating manual before starting up and use of the equipment. The information and warnings given in this operating manual must be heeded.
- Attention must be paid to the requirements of the Type Examination Certificate (see appendix).
- Any work on electrical equipment is only to be carried out by trained specialists as per the regulations currently in force.
- Attention must be paid to the requirements of VDE 0100 (IEC 364) when setting high-power electrical units with nominal voltages of up to 1000 V, together with the associated standards and stipulations.
- Check the details on the type plate to ensure that the equipment is connected to the correct mains voltage.
- Protection against touching dangerously high electrical voltages:
Before opening the equipment, it must be switched off and hold no voltages. This also applies to any external control circuits that are connected.
- The device is only to be used within the permitted range of temperatures.
- For use in hazardous area, observe the relevant national and international directives and regulations.
- The device needs to be mounted inside a housing or cabinet with protection class IP54 or higher, complying with the IEC 60079-0 standard.
- Installation, maintenance, inspections and any repairs of the devices must be carried out only by qualified and skilled personnel in compliance with the current regulations.

6 INTENDED USE

The **MCU1000EX** is intended to be used as a built-in device for measuring and controlling temperature. Use the device in the permitted range of the electrical and environmental specifications only. See table technical data for details. Do not use the device if it is damaged or visibly not in good conditions.

If the device is used improperly or not for its intended purpose, its operational safety may be impaired. The manufacturer is not liable for damages resulting from such improper use.

7 REASONABLY FORESEEABLE MISUSE

Do not connect or operate the device outside the specifications stated in the technical data table. Pay attention to the electrical connection diagram. Do not switch the electrical terminals. Always operate the **MCU1000EX** inside a housing or cabinet with protection class IP54 or higher.

8 NECESSARY QUALIFICATION FOR PERSONNEL

Qualified personnel are persons who are familiar with the installation, commissioning, maintenance and operation of the product and have the necessary qualifications through training or instruction. Qualified personnel must have at least the following knowledge:

- Instructed person in EX-protection
- Trained person in the electrotechnical field
- Detailed knowledge of the operating instructions and the applicable safety regulations
- Trained technician, who has appropriate knowledge about handling temperature controllers.

9 INFORMATION AND SAFETY INSTRUCTIONS FOR USING THE TEMPERATURE CONTROLLER IN HAZARDOUS AREAS

The **MCU1000EX** is suitable for using in hazardous area of zone 2 (see Type Examination Certificate).

The explosion proof protection is:

 II 3G Ex ec nC IIC T4 Gc

Type Examination Certificate Number: SIQ 24 ATEX 099 X

IECEX Certificate of Conformity Number: IECEX SIQ 24.0001X

The certification of the temperature controller was done by SIQ.

For detailed information, an excerpt of the Type Examination Certificate and a copy of the IECEX Certificate of Conformity see appendix.



Installation and operating of the temperature controller have to be done corresponding to the conditions specified in the Type Examination Certificate and the IECEX Certificate of Conformity. Only in this case the reliability of the operation in the hazardous area can be guaranteed.

Any modification of the standard configuration of the device with parts, which are not approved by M&C and not explicitly specified for usage in explosive atmospheres, will void the Type Examination Certificate. This also refers to any repair work and service using parts which are not M&C approved and not specified for usage in explosive atmospheres.

Please don't hesitate to contact M&C or your M&C distributor if you have any questions about parts, service and repair work of the device.



Work on the temperature controller can only be carried out by qualified personnel when the process and area is declared as an explosive free zone. An explosive free zone is free of explosive atmosphere.



Disconnect power supply before opening the device for access.
Make sure that all external power supplies are disconnected.

This also applies to any external control circuits which may be connected.



Pay close attention to the requirements of the Type Examination Certificate: SIQ 24 ATEX 099 X.




10 INTRODUCTION

The digital electronic temperature controller **MCU1000EX** is used for simple temperature control. It is designed in a compact construction and is suitable for panel-mounting.

11 APPLICATION

The **MCU1000EX** is a device used for controlling temperature of gas coolers and heaters. The **MCU1000EX** can be built into front panels of gas cooling devices and heating devices.

12 TECHNICAL DATA

Temperature Controller Type	MCU1000EX	
Part No.	04E1200	
Electrical data		
Supply voltage	100 – 240 V AC -15 %/+10 %	
Frequency	50 – 60 Hz	
Protection Rating	Class II	
Electrical Connection	Terminals with push-in spring connections on the back of the device, nominal wire cross-section AWG24 - AWG16 (0.2 - 1.5 mm ²)	
Certification		
Explosion proof protection	 	 II 3G Ex ec nC IIC T4 Gc Type Examination Certificate Number: SIQ 24 ATEX 099 X IECEx Certificate of Conformity Number: IECEx SIQ 24.0001X
Electrical safety	EN	EN 61010
EMC	EN 61326-1:2013 Residential and industrial areas Interference emission: Group 1, Class B Interference immunity: Class A Max. frequency 48 MHz	
Oversvoltage Category	OVC II	

Temperature Controller Type	MCU1000EX
Pollution Degree	2
Electrical interface	
Status relay output	SPST-NO, 240 V AC, 30 V DC, 4 A
Control output	Binary, 5 V, 100 Ohm output resistance
Permitted cable lengths	Temp. sensor < 3 m [\approx 9.8 ft] length Control output < 3 m [\approx 9.8 ft] length
Environmental conditions*	
Operating ambient temperature	-20 to +60 °C [-4 to 140 °F], non-condensing
Storage temperature	-40 to +70 °C [-40 to 158 °F]
Max. installation altitude	2000 m [\approx 6561.7 ft] above sea level
Humidity	< 90 % rel., non-condensing
Degree of ingress protection (IEC 60529)	IP20
Controller data	
Adjustable temperature range in °C	-40 to +999 °C [-40 to 1830.2 °F]
Display range in °C/Resolution	-99 to +999 °C [-146.2 to 1830.2 °F]/3 digits/1 decimal point
Relay status indicator	Red LED
Control type	PID, indicator yellow LED
Temperature Input	
Temperature sensor input	Pt100 or thermo couple type K
Accuracy	Pt100: ± 1 K, thermo couple type K: ± 3 K
Housing	
Mounting type	Panel mounting according to DIN 43700, 45 x 22.5 mm [\approx 1.8" x 0.9"]
Mounting clearance	15 mm [\approx 0.6"] horizontal, 10 mm [\approx 0.4"] vertical
Housing material	Polyamide PA6
Dimensions (W x H x D)	49 x 32 x 99.5 mm [\approx 1.9" x 1.3" x 3.9"]
Weight	80 g [\approx 0.18 lb]

*The **MCU1000EX** needs to be mounted inside a housing or cabinet with protection class IP54 or higher, complying with the IEC 60079-0 standard.

13 DESCRIPTION

The **MCU1000EX** measures temperature signals via a Pt100 or a thermocouple interface. The user-friendly three-digit 7-segment display and the two status LEDs on the front display show the status of the temperature controller. Four capacitive buttons allow a configuration of the device.

An alarm relay on the output side indicates whether the temperature value is within a user-definable range around the set point or not. Depending on the measured temperature a binary control signal with the voltage levels of 0 V and 5 V is generated. The control signal is used by a component with a digital input, which is designed to alter the measured temperature.

The temperature controller has no ground wire connection.

The **MCU1000EX** has a housing protection degree of IP 20. The device needs to be mounted inside a housing or cabinet with protection class IP54 or higher, complying with the IEC 60079-0 standard.



- ① Display for alarm (K1, red LED) or control output high/low (K2, yellow LED)
- ② Three-digit 7-segment display
- ③ ESC and OK button to cancel or confirm a setting
- ④ UP and DOWN buttons to navigate through the menus

Figure 1 LCD display description



14 RECEIPT OF GOODS AND STORAGE

- Immediately after arrival, remove the controller and eventual accessories carefully from the packing and check the articles for completeness against the packing list.
- Check the goods for any damage during transportation and, if required, inform your shipping insurance immediately of the damage found.



Note

The controller should be stored in a weather-protected and frost-free area!

14.1 PRODUCT LABEL AND SERIAL NUMBER

The product label with the serial number is placed on the top of the device.

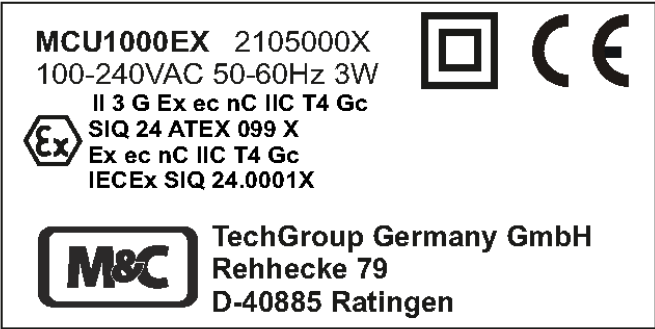


Figure 2 Product label MCU1000EX

15 DIMENSIONS

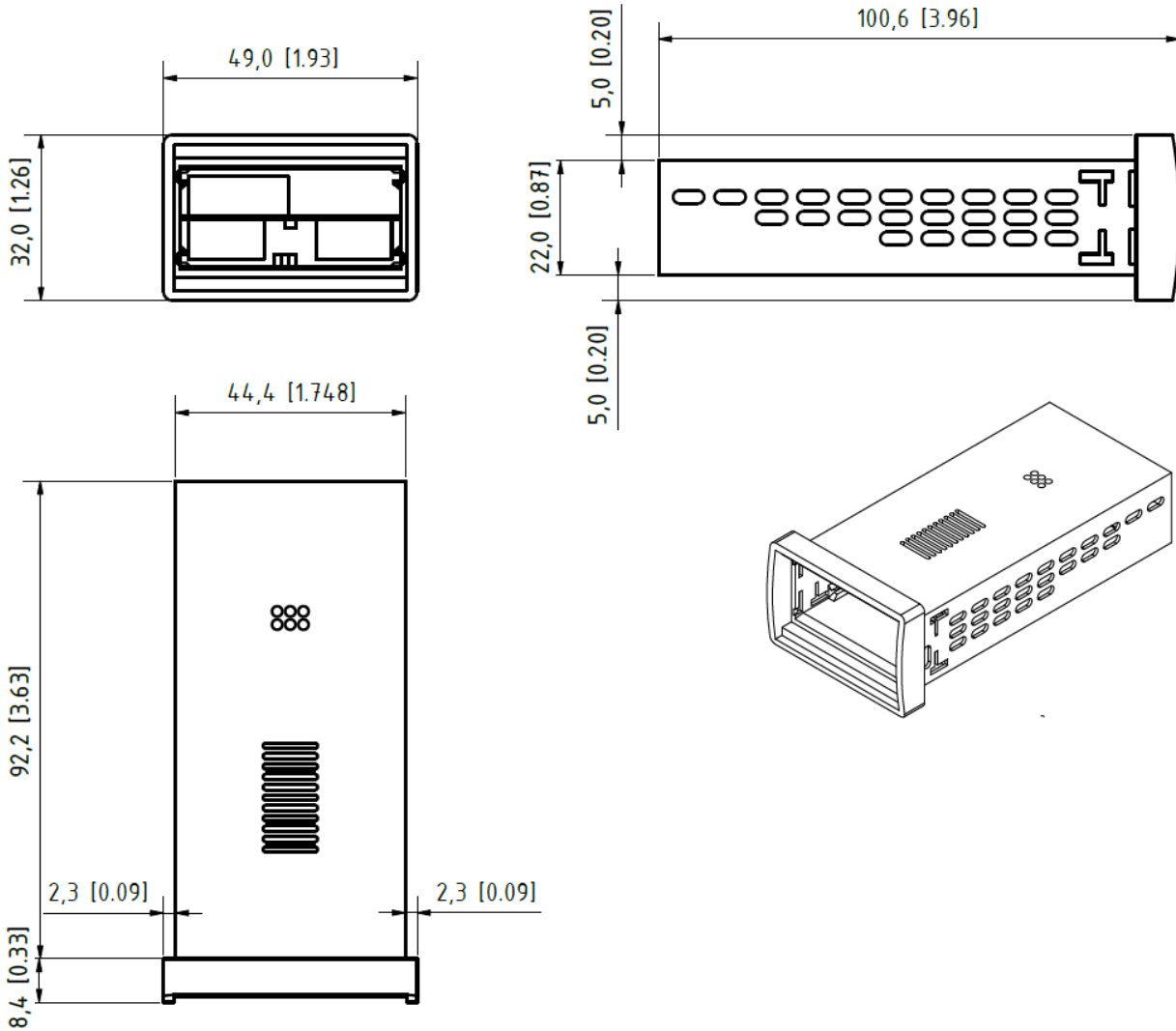


Figure 3 Dimensions

16 ASSEMBLY, LOCATION AND MOUNTING REQUIREMENTS



Only carry out work on the temperature controller when the process and area are declared as an explosive free zone. An explosive free zone is free of explosive atmosphere.

The device is completely assembled. It consists of the device body and a mounting frame. To mount the device, the mounting frame needs to be removed from the device body.



Note

The minimum spacing of panel cut-outs for tight-to-tight mounting is 15 mm [\approx 0.6"] horizontal and 10 mm [\approx 0.4"] vertical.

The controller is designed for panel-mounting. The following cut-out dimensions are required for mounting the device: width 45 mm [\approx 1.8"] with +0.6 mm [\approx 0.02"] tolerance, height 22.2 mm [\approx 0.9"] with +0.3 mm [\approx 0.01"] tolerance.

16.1 MOUNTING THE TEMPERATURE CONTROLLER

Insert the device (1) from the front into the panel cutout.
Push the mounting frame (2) from the rear of the control panel onto the device body so that the springs press against the rear of the control panel.
Press the fastening frame against the back of the control panel until the latching notches snap into the grooves provided for this purpose. The snap-in action ensures adequate fastening.

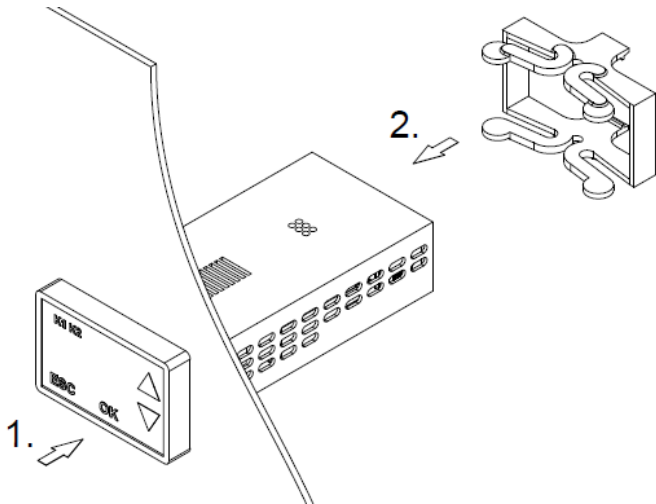


Figure 4 Mounting the MCU1000EX into a front panel

17 VENTILATION REQUIREMENTS

There are minimum spacing between panel cut-outs for the **MCU1000EX** to ensure sufficient ventilation. The minimum spacing of panel cut-outs for tight-to-tight mounting is 15 mm [\approx 0.6"] horizontal and 10 mm [\approx 0.4"] vertical.

18 ELECTRICAL CONNECTIONS



Only carry out work on the temperature controller when the process and area are declared as an explosive free zone. An explosive free zone is free of explosive atmosphere.



Warning

A wrong mains voltage can destroy the device. Please ensure that the supply voltage is identical to the indication on the type plate.



Warning

When setting high-power electrical units with nominal voltages of up to 1000 V, attention must be paid to the requirements of VDE 0100 together with the associated standards and stipulations!
A main switch must be provided externally.



The main circuit of the instrument must be equipped with a fuse corresponding to the nominal voltage (over current protection); for electrical details see technical data.

To connect the device electrically, use the screw terminals on the back of the housing.

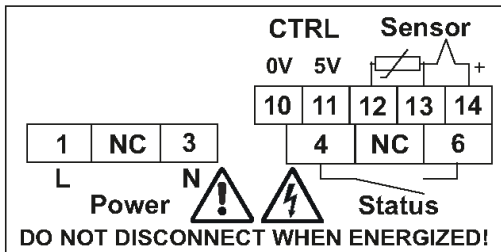


Figure 5 Electrical connections on the rear: MCU1000EX



Relay

Mains voltage may be applied to the relay. The user is responsible for ensuring that the maximum current is not exceeded. By providing a fuse or an appropriately high impedance (or both).



19 INITIAL STARTING

The **MCU1000EX** is operated via 4 buttons (OK, ESC, UP and DOWN) and a 3-digit 7-segment display. In the basic state, the display shows the current temperature in °C.

1. Connect the temperature sensor Pt100 to the terminals **12** and **13**. Connect the actuator to the control output terminals **10** and **11**.
2. Connect the mains voltage terminals identified with **L** and **N** to the supply voltage.

For starting the controller, it is necessary to make some configurations beyond those adjusted at works. For this purpose, the set point (SP) must be determined, and the temperature input must be selected. Additionally, it is possible to adjust a high and a low value for alarming. The alarm is displayed in the controller’s display in case these values are increased or decreased.

19.1 DEVICE SECURED BY PIN

In the delivery state, the device is secured by a PIN. The pin request appears when the OK key is held down for longer than 2-3 seconds. A flashing "000" will be displayed. This display can be adjusted between -99 and 999 with the arrow keys. To unlock the device, the display must be set to "017" and then confirmed with **OK**.



Note

Basically, all flashing displays are adjustable. Press ESC to cancel the input process.

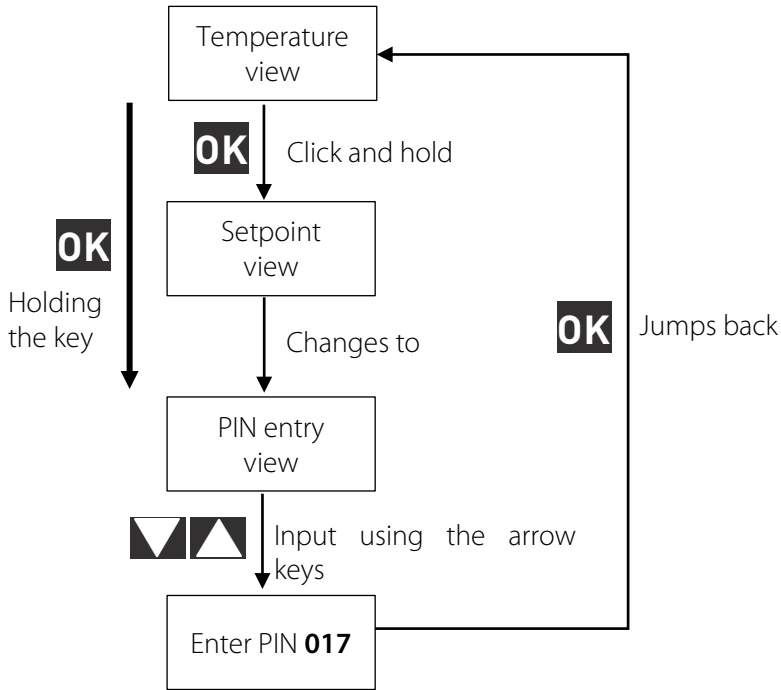


Figure 6 Unlock the device

19.2 OPERATING THE DEVICE

In normal operation, the display shows the measured temperature (temperature view). The ESC key and the arrow keys (UP and DOWN) have no function in the temperature view.

While tapping on the OK key, the adjusted setpoint is displayed. The factory setting of the setpoint is "5.00". After releasing the key, the display immediately returns to the temperature view. The setpoint is only visible when the key is touched.

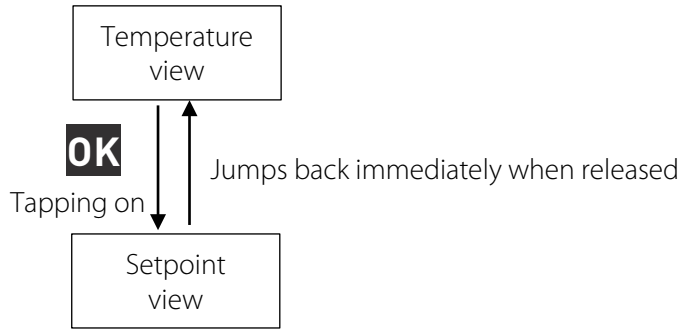


Figure 7 Setpoint view



19.3 CHANGING THE SETPOINT

In the unlocked state, the setpoint can be adjusted by pressing and holding the OK key in the temperature view. First the set setpoint value is displayed. After 2-3 seconds, it starts to flash.

Is the display showing a flashing "000" the device needs to be unlocked. Use the arrow keys to enter the PIN code "017" and confirm the entry with OK. The display jumps back to the temperature view.

The setpoint can be adjusted with the arrow keys while the display is flashing. With OK, the new setpoint is accepted. Press ESC to discard the current changes. In both cases, the display jumps back to the normal temperature display after actuation.

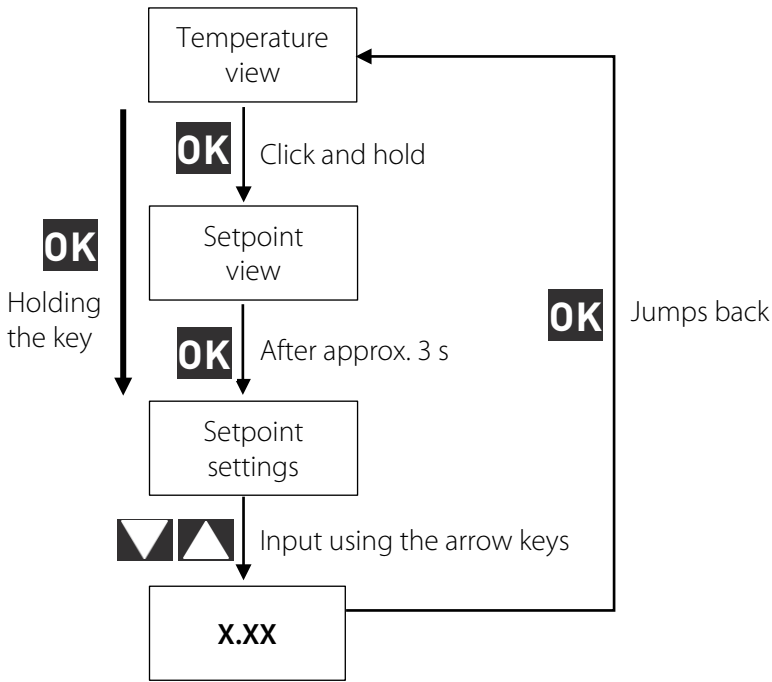


Figure 8 Setting the setpoint

19.4 CONFIGURATION MENU

Follow these steps to enter the configuration menu:

1. Press and hold the OK key, until the display changes to "C", followed by two digits. The digits represent the configuration code, and they are blinking.



Note

You will enter the setpoint setting during this procedure, please continue to hold the OK button.

2. Use the UP and DOWN keys to select a configuration code. The table below shows the possible settings and configurations.
3. Press the OK button to confirm the selection or tap on the ESC key to cancel and leave the configuration menu without selection.
4. Use the UP and DOWN keys to choose the desired value.
5. Confirm the value by pressing on the OK key.

- To leave the configuration menu tap on the ESC key at any time. The display will go back to the current temperature value.

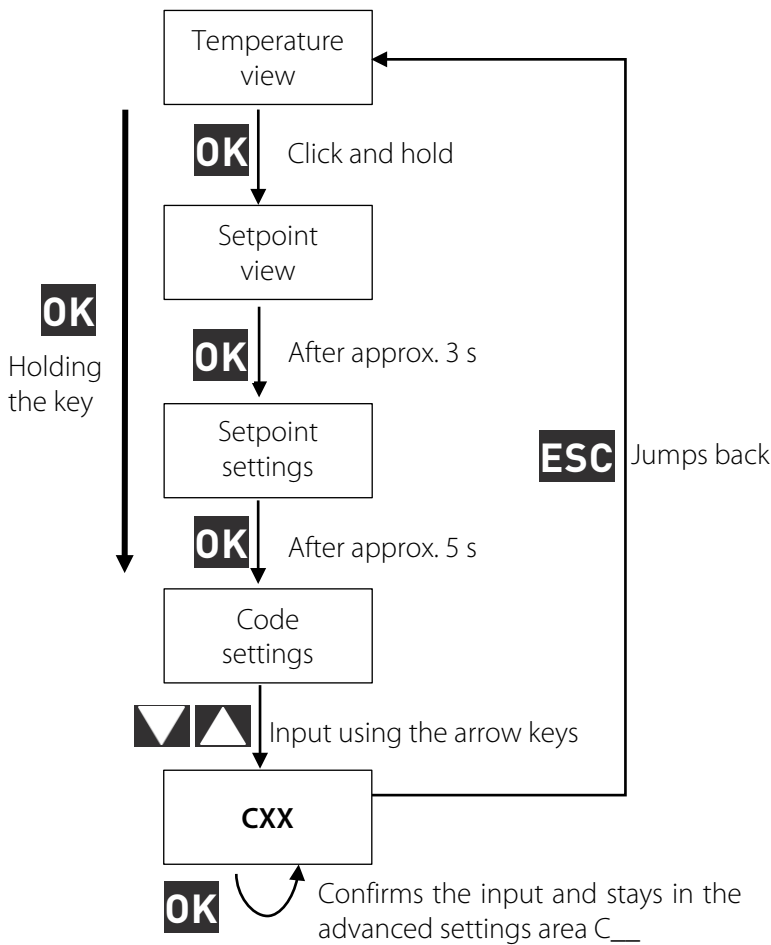


Figure 9 Access the configuration menu and set the codes



Press ESC to cancel the input process. The changed values are not accepted.

Note

No.	Description	Range	Note
C08	Activating the PIN request	Values: 0 or 1	0 : No PIN request 1 : PIN request activated PIN 017 must be entered to unlock the device. The PIN entry is reset approx. 5 minutes after the last button operation or after a restart.
C11	Offset correction of the temperature measurement	Min. -20 °C Max. 20 °C	To adjust the offset of the temperature measurement

No.	Description	Range	Note
C20	Temperature threshold HIGH	Min. 1 °C + (0,5 x alarm threshold hysteresis) Max. 50 °C	<p>Interval between the setpoint temperature and the upper temperature alarm in °C.</p> <p>Temperature alarm triggers at $T_{\text{MEASURED}} > T_{\text{SET}} + \text{temperature threshold HIGH} + (0.5 \times \text{alarm threshold hysteresis})$</p> <p>Temperature alarm is resolved at $T_{\text{MEASURED}} < T_{\text{SET}} + \text{temperature threshold HIGH} - (0.5 \times \text{alarm threshold hysteresis})$</p> <p>Example: setpoint 5 °C, temperature threshold HIGH 3 °C, alarm threshold hysteresis 2 °C, temperature alarm triggers at temperatures above 5 °C + 3 °C + (0.5 x 2 °C) = 9 °C, temperature alarm is resolved at temperatures below 5 °C + 3 °C - (0.5 x 2 °C) = 7 °C.</p>
C21	Temperature threshold LOW	Min. 1 °C + (0,5 x alarm threshold hysteresis) Max. 50 °C	<p>Interval between setpoint temperature and the lower temperature alarm in °C.</p> <p>Temperature alarm triggers at $T_{\text{MEASURED}} < T_{\text{SET}} - \text{temperature threshold LOW} - (0.5 \times \text{alarm threshold hysteresis})$</p> <p>Temperature alarm is resolved at $T_{\text{MEASURED}} > T_{\text{SET}} - \text{temperature threshold LOW} + (0.5 \times \text{alarm threshold hysteresis})$</p> <p>Example: setpoint 6 °C, temperature threshold LOW 2 °C, alarm threshold hysteresis 1 °C, temperature alarm triggers at temperatures below 6 °C – 2 °C - (0.5 x 1 °C) = 3.5 °C, Temperature alarm is resolved at temperatures above 6 °C – 2 °C + (0.5 x 1 °C) = 4.5 °C.</p>

No.	Description	Range	Note
C22	Alarm threshold hysteresis	Min. 1 °C Max. 50 °C	<p>Hysteresis between triggering and resolving an alarm. Applies to interval alarm - temperature threshold HIGH and alarm - temperature threshold LOW.</p> <p>ATTENTION: If the temperature threshold HIGH and temperature threshold LOW are smaller than the minimum value dependent on the alarm threshold hysteresis, the temperature thresholds are automatically increased to the new minimum value and saved.</p> <p>Example: set point 5 °C, temperature threshold HIGH 3 °C, alarm threshold hysteresis 2 °C, temperature alarm triggers at temperatures above $5\text{ °C} + 3\text{ °C} + (0.5 \times 2\text{ °C}) = 9\text{ °C}$, temperature alarm will be resolved at temperatures below $5\text{ °C} + 3\text{ °C} - (0.5 \times 2\text{ °C}) = 7\text{ °C}$.</p>
C23	Polarity of the alarm relay in the event of an alarm	Values: 0 or 1	<p>1: In the operational state, the relay is closed and conductive. In the event of an alarm, the relay opens and becomes non-conductive. The alarm state corresponds to the de-energized, switched-off state.</p> <p>ATTENTION: Safety First only with this setting.</p> <p>0: In the event of an alarm, the relay closes and becomes conductive. In the operational state, the relay opens and becomes non-conductive.</p> <p>ATTENTION: The operational state cannot be distinguished from the switched off/defective state.</p>

19.5 FUNCTIONAL TEST

Principally, it must be checked after the initial starting whether the controller is switching according to the adjusted values and whether the determined operating temperature is reached.

The first function test has to be performed as follows:

1. Switch on the power supply.
2. After the set point temperature is being reached, the alarm status changes to OK → the red LED is extinguished.

20 ERROR MESSAGES

Display	Cause/remedy or instruction for action
---	Check temperature sensor. If problem persists, send back to M&C Service.

21 DECOMMISSIONING

No special measures are to be taken for decommissioning the equipment.

22 MAINTENANCE AND REPAIR



Only carry out work on the temperature controller when the process and area is declared as an explosive free zone. An explosive free zone is free of explosive atmosphere.



The controller **MCU1000EX** is working maintenance-free for a long period of time. In case the temperature controller is defective, please send the device to M&C TechGroup for repair.

23 PROPER DISPOSAL OF THE DEVICE

At the end of the service life of our products, it is important to take care of the appropriate disposal of obsolete electrical and non-electrical devices. To help protect our environment, follow the rules and regulations of your country regarding recycling and waste management.

24 APPENDIX

- Excerpt from the Type Examination Certificate
- IECEx Certificate of Conformity



For further product documentation, please see our website:
www.mc-techgroup.com



(1) **TYPE EXAMINATION CERTIFICATE**

(2) Product Intended for use in Potentially Explosive Atmospheres – **Directive 2014/34/EU**

(3) Type Examination Certificate Number:

SIQ 24 ATEX 099 X

Issue: 0



(4) Product: Electronic Temperature Controller, type: MCU1000EX

(5) Manufacturer: M&C TechGroup Germany GmbH

(6) Address: Rehhecke 79, 40885 Ratingen, Germany

(7) This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) SIQ Ljubljana certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive 2014/34/EU.

The examination and test results are recorded in the confidential test report TEx099/24.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0:2018 + AC:2020-02

EN IEC 60079-15:2019

EN IEC 60079-7:2015 + A1:2018

Where additional criteria beyond those given here have been used, they are listed at item (18) in the schedule to this certificate.

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to Specific Conditions of Use specified in the schedule to this certificate.

(11) This Type Examination Certificate relates only to the design and construction of the specified product in accordance with the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

(12) The marking of the product shall include the following:

 **II 3 G Ex ec nC IIC T4 Gc**

Certification body



Ljubljana, 11 March 2024

Bojan Pečavar

Page 1/4

The Type Examination Certificate is valid only if signed. The certificate may be reproduced only in full and without changes. Any extracts and changes shall be approved by SIQ Ljubljana.

SIQ Ljubljana is accredited by Slovenian Accreditation with accreditation number CP-001 in the field of certification of products, processes and services (SIST EN ISO/IEC 17065).

SIQ Ljubljana, Mašera-Spasičeva ulica 10, SI-1000 Ljubljana, +386 1 4778 221, ex@siq.si

Figure 10 Type Examination Certificate: 1. Page



(13)

SCHEDULE(14) **Type Examination Certificate Number SIQ 24 ATEX 099 X, Issue: 0**(15) Description of Product

Electronic Temperature Controller, type: MCU1000EX, is a device for controlling of gas coolers and heaters. It is designed in type of protection increased safety "ec" (electronics) and type of protection "nC" (relays). It has plastic enclosure with degree of ingress protection of IP20. Final enclosure of IP54 according to EN IEC 60079-0 and EN IEC 60079-7 is intended to be assured by final device.

Technical data

Supply voltage: 100 V – 240 V a.c., 50 Hz – 60 Hz

Status relay output: SPST-NO, 240 V a.c., 30 V d.c., 4 A

Control output: Binary, 5 V, 100 Ohm output resistance

Electrical connections: 0.2 – 1.5 mm² (AWG24 – AWG16)

Ambient temperature range: -20°C to +60°C

(16) Test Report

TEx099/24 dated 11 March 2024.

(17) Specific Conditions of Use

- Electronic Temperature Controller shall be installed in a suitable housing so that a degree of protection of at least IP54 according to EN IEC 60079-0 and EN IEC 60079-7 is achieved. This is assured with enclosure in type of protection Ex ec or Ex eb.
- The installation in the enclosure must be carried out in such a way that the allowed ambient temperature range from -20°C to +60°C is not exceeded during operation.
- The distances to other components or walls shall be at least 15 mm (left, right) and 10 mm (top, bottom).
- Connection or disconnection of wires is permitted only when explosive atmosphere could not be present or electrical circuits are deenergized.

(18) Essential Health and Safety Requirements

Compliance with the Essential Health and Safety Requirements has been assured by compliance with the requirements of the standards listed under item (9).

Figure 11 Type Examination Certificate: excerpt from 2. page



IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx SIQ 24.0001X	Page 1 of 3	Certificate history:
Status:	Current	Issue No: 0	
Date of Issue:	2024-03-11		
Applicant:	M&C TechGroup Germany GmbH Rehhecke 79 40885 Ratingen Germany		
Equipment:	Electronic Temperature Controller, type: MCU1000EX		
Optional accessory:			
Type of Protection:	Increased safety "ec", Type of protection "n"		
Marking:	Ex ec nC IIC T4 Gc		

Approved for issue on behalf of the IECEx
Certification Body:

Bojan Pečavar

Position:

Director of Certification

Signature:
(for printed version)

Date:
(for printed version)

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.




Certificate issued by:

Slovenian Institute of Quality and Metrology (SIQ)
Masera-Spasicева ulica 10
SI-1000 Ljubljana
Slovenia



Figure 12 IECEx Certificate: 1. page





IECEX Certificate of Conformity

Certificate No.:	IECEX SIQ 24.0001X	Page 2 of 3
Date of issue:	2024-03-11	Issue No: 0
Manufacturer:	M&C TechGroup Germany GmbH Rehhecke 79 40885 Ratingen Germany	
Manufacturing locations:	M&C TechGroup Germany GmbH Rehhecke 79 40885 Ratingen Germany	

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

- [IEC 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0
- [IEC 60079-15:2017](#) Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
Edition:5.0
- [IEC 60079-7:2017](#) Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:5.1

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Report:
[SI/SIQ/ExTR24.0001/00](#)

Quality Assessment Report:
[DE/BVS/QAR17.0009/06](#)

Figure 13 IECEx Certificate: 2. page



IECEx Certificate of Conformity

Certificate No.: **IECEx SIQ 24.0001X**

Page 3 of 3

Date of issue: 2024-03-11

Issue No: 0

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

Electronic Temperature Controller, type: MCU1000EX, is a device for controlling of gas coolers and heaters. It is designed in type of protection increased safety "ec" (electronics) and type of protection "nC" (relays). Final enclosure of IP54 according to IEC 60079-0 and IEC 60079-7 is intended to be assured by final device.

Supply voltage: 100 V – 240 V a.c., 50 Hz – 60 Hz

Status relay output: SPST-NO, 240 V a.c., 30 V d.c., 4 A

Control output: Binary, 5 V, 100 Ohm output resistance

Electrical connections: 0.2 – 1.5 mm² (AWG24 – AWG16)

Ambient temperature range: -20°C to +60°C

SPECIFIC CONDITIONS OF USE: YES as shown below:

- Electronic Temperature Controller shall be installed in a suitable housing so that a degree of protection of at least IP54 according to IEC 60079-0 and IEC 60079-7 is achieved. This is assured with enclosure in type of protection Ex ec or Ex eb.
- The installation in the enclosure must be carried out in such a way that the allowed ambient temperature range from -20°C to +60°C is not exceeded during operation.
- The distances to other components or walls shall be at least 15 mm (left, right) and 10 mm (top, bottom).
- Connection or disconnection of wires is permitted only when explosive atmosphere could not be present or electrical circuits are deenergized.

Figure 14 IECEx Certificate: 3. page