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Ex-MX2

Bedienungsanleitung

Operating Instructions

Notice d'utilisation

Gebbruiksaanwijzing

Istruzioni per l'uso

Instrucciones de uso

Manual de instruções

Bruksanvisning





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Note:

The current operating instructions, EC Declaration of Conformity and the Ex-certificate are available for download from the relevant product page under www.ecom-ex.com; alternatively they can be requested directly from the manufacturer.

1. Application

The Ex-MX2 is a contactless temperature measuring device designed for industrial use in potentially explosive areas of Zones 2 and 1 in accordance with Directive 99/92/EC (ATEX 137).

2. Safety instructions

These operating instructions contain information and safety regulations that must be followed to ensure safe and reliable operation of the unit under the described conditions. Failure to follow the information and instructions can have dangerous consequences or may contravene applicable regulations.

Please take the time to carefully read through the owner's manual before you start using the unit.

In the event of any doubt or discrepancies (for example, due to translation or printing errors), the German version of these operating instructions shall prevail.

3. Errors and load restrictions

If there is any risk that the safety or integrity of the unit has been compromised, the unit must be taken out of operation immediately and removed from the Ex-area without delay.

Action must be taken to prevent the device from being accidentally placed into operation again.

We recommend sending the unit to the manufacturer to be examined.

The safety and reliability of the unit may be at risk if, for example:

- Damage is visible on the housing
- The unit has been subjected to excessive loads for which it is not designed
- The unit has been improperly stored
- The unit has been damaged in transit
- Labels or markings on the unit are illegible
- Malfunctions occur
- Obvious measuring inaccuracies occur
- no more measurements are possible with the device
- Permitted tolerances or threshold values have been exceeded

4. Safety regulations

Persons using the unit must observe the standard safety regulations and read the certificate to prevent incorrect operation or misuse of the unit.

The following additional safety regulations must also be observed:

- The unit must not be opened within the Ex-area.
- The batteries must only be changed outside the Ex-area.
- Additional or spare batteries must not be carried in the Ex-area.
- Only approved battery types may be used.
- In potentially explosive areas, the device may only be operated in its leather pouch.

During use, always make sure that the leather pouch is completely closed and undamaged.

- Only accessories approved by ecom instruments GmbH may be used.
- Avoid using the unit in aggressive acidic or alkaline solutions.
- Ensure that the unit is not taken into Zone 0 areas.

4.1 Special conditions for use in Zone 0 areas

Temperature measurement with the Ex-MX2 is only allowed within Zone 0 only if the following conditions are met:

1. The Ex-MX2 temperature measuring device itself must not be brought into Zone 0.
2. Absolutely ensure that the device cannot fall into Zone 0, even by mistake. To ensure this, the device's carrying sling must also be attached securely to the operator's belt or to a belt loop.

The length of the carrying sling should be measured so that the Ex-MX2 still maintains a distance of 50 cm to the boundary area of Zone 0 when it hangs freely on the carrying sling.

Only the accessories approved by ecom instruments GmbH may be used.

5. Safety instructions



- Caution: laser beam!
- Do not look directly into the laser beam!
- Do not aim the beam at other people!
- Danger of eye damage!
- Laser class 2
- Power: < 1 mW
- Wave length: 635 nm

6. Ex data

EC-type examination certificate no.: TÜV 00 ATEX 1597 X

Ex designation:  II 2 G EEx ia IIC T4

Approved for Zones 1 and 2, device group II, gas group C potentially explosive gases, vapours or mist, temperature class T4.

7. Technical data

Measuring range:	-30 ... +900 °C
Ambient temperature:	0 °C ... +50 °C; laser operation up to maximum +45 °C
Storage temperature:	-20 °C ... +50 °C (without batteries)
Batteries / power supply:	2 x LR06 (AA) according to IEC
Emissivity:	0.10 ... 1.50 (0.95 preset)
Measuring spot marking:	3 point laser marking

Measuring spot size (distance / Ø):	60:1 at the focus point (1.15 m) and 35:1 in the far field (> 10 m)
Accuracy (25 °C):	± 0.75% of the measured value or ± 0.75K, whichever is the larger value (± 2K for measurement objects below -5°C)
Ambient derating (at 25 °C ± 25K):	<0.05K/K or <0.05%/K, whichever is the larger value
Reproducibility:	± 0.5% of the measured value or ± 0.5K, whichever is the larger value
Spectral sensitivity:	8 ... 14 µm
Response time:	95 % after 250 ms
Relative humidity:	10% ... 95 % relative humidity at +30°C, non- condensing
Dimensions:	200 x 170 x 50 mm
Weight:	Approx. 450 g
CE designation:	CE 0102

Manufacturer:	Model (LR6):
Varta	Alkaline No. 4806 LR6
Varta	Alkaline Extra Longlife No. 4006
Varta	Alkaline Maxi Tech No. 4706
Varta	Alkaline Electric Power No. 8006
Varta	No. 4706 Alkaline LR6
Varta	LR6 High Energy No. 4906
Duracell	Alkaline
Duracell	Professional Alkaline Battery Procell
Duracell	Alkaline Ultra
Duracell	Ultra M3 MN1500 LR6
Duracell	Plus MN1500 LR6
Duracell	Procell MN1500 LR6
Panasonic	Alkaline Power Line Industrial Battery LR6
Panasonic	Powermax 3 LR6
Eveready	Alkaline Energizer
Eveready	Energizer No. E91
GP	Super Alkaline Battery 15A LR6
Daimon	Alkaline
Rayovac	Maximum Alkaline Battery
Double Lion King	Alkaline Battery
RS	Alkaline

8. Functional description / operating information

Please take the time to carefully read through these operating instructions to ensure that you are familiar with and can use all the functions on your Ex-MX2. For your own safety and information please read through the information on the following pages.

8.1 Operation

All objects with a temperature above absolute zero radiate infrared energy which spreads in all directions at the speed of light. If an infrared thermometer is aimed at a measurement object, the lens collects the energy and focuses it on an infrared sensor.

The sensor reacts by outputting a voltage signal which is directly proportional to the absorbed energy. Using additional parameters, the microprocessor-controlled electronics of the device are able to determine and display the current temperature. Measurement objects with a shiny or polished surface do not only radiate energy but also reflect a part of the radiation from their surroundings.

An emissivity factor between 0.1 and 1.5 takes account of this fact so that only the really radiated (and not the reflected) energy is included in the calculation of the measured value. The majority of all applications are measured with emissivity of 0.95.

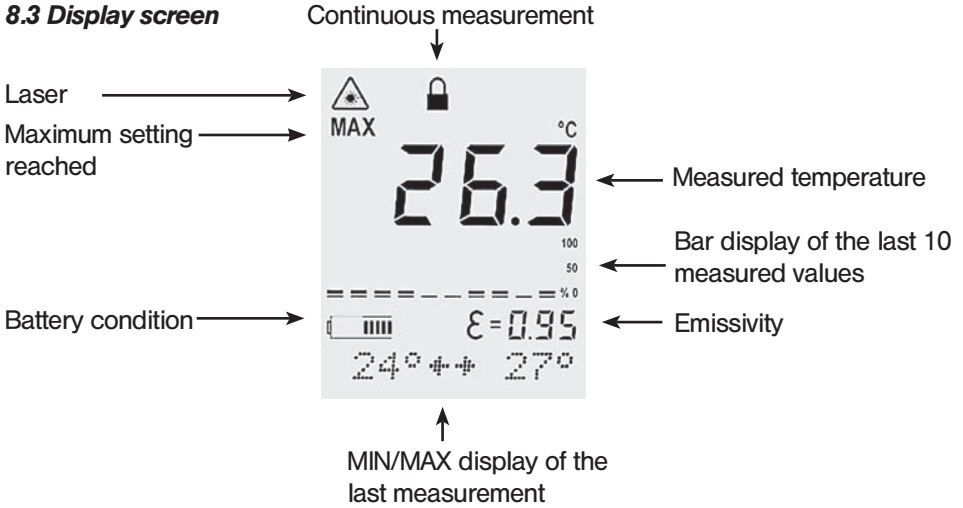
It is therefore preset to 0.95 in our machine and can be adjusted depending on the application in steps of 0.01. The emissivity range greater than 1.00 is intended for applications where measurement objects close to each other with different temperatures should be measured. This is the case for example if there are two conveying lines with different temperatures and the temperature of „the colder one“ of both should be measured.

The radiated reflected energy thereby would falsify the measurement so that a correct result would be impossible. The temperature can now also be measured exactly using the emissivity setting >1.00 by means of a one-time reference measurement with a contact thermometer.

8.2 Overview



8.3 Display screen



8.4 Settings

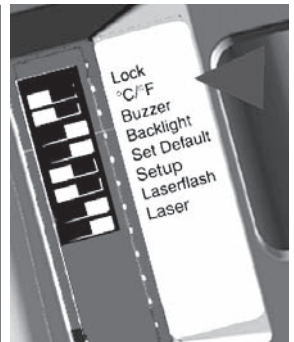
System settings can be fixed and activated with the switch panel.



Remove the leather pouch and open the casing with the handle as shown.

Description:

Adjustment	Standard	Description
LOCK	OFF	Measuring remains active until the measurement button is pressed again.
° C / °F	OFF	Changing the display between °C and °F
Buzzer	ON	audible alarm
backlight	OFF	display lighting
Set Default	OFF	Activation of the factory defaults
Setup	ON	activates alarm value and emissivity adjustment
Laserflash	ON	Laser flashing with HI alarm
Laser	ON	Laser is switched on



8.4.1 Emissivity

Most organic materials and lacquered and oxidised surfaces have an emissivity of 0.95. The emissivity is preset to 0.95 in the Ex-MX2 for this reason, but can be changed with the rocker switch.

The determination of the temperatures of shiny or highly polished metal surfaces produces inaccurate measured values. To compensate for this, the surface to be measured can be covered with adhesive tape or painted matt black. Wait until the adhesive tape is the same temperature as the material underneath it. Then determine the temperature of the adhesive tape (corresponds to the material) or the painted surface.

Aluminium*	0.30	Skin	0.98	Brass*	0.50
Asbestos	0.95	Wood***	0.94	Oil	0.94
Asphalt	0.95	Limestone	0.98	Paper	0.95
Basalt	0.70	Ceramics	0.95	Sand	0.90
Concrete	0.95	Carbon	0.85	Dirt	0.94
Lead*	0.50	Copper*	0.95	Snow	0.90
Ice	0.98	Plastic**	0.95	Steel*	0.80
Iron*	0.70	Foodstuffs,	0.90	Textiles	0.94
Paint	0.93	frozen		Water	0.93
Glass (plate)	0.85	Foodstuffs,	0.93	Bricks	0.90
Rubber	0.95	hot			

*oxidised, **impervious to light, more than 50 µm, ***natural

8.4.2 HI alarm

The Ex-MX2 provides an alarm function for exceeding defined temperature values. By pressing the ENTER key, the alarm value can be set afterwards with the rocker switch. The temperature values can be moved through in large steps by keeping the rocker switch pressed. After confirming with the ENTER key, if the measured value is exceeded, an alarm signal sounds, the LED above the display lights and the laser marking flashes. The default value is 50°C.

8.5 Measurement

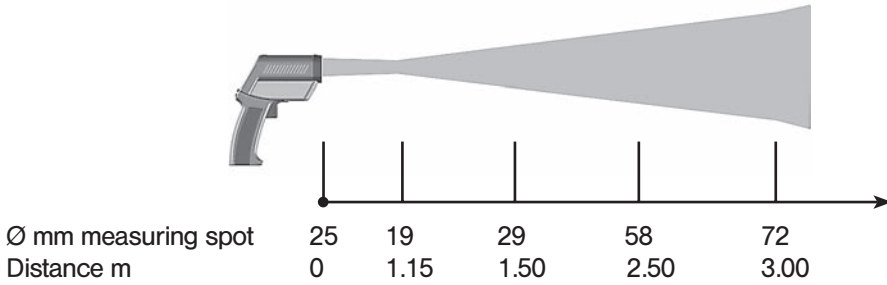
The device is aimed at an object and the measurement button pressed to determine the temperature. Remember to take account of the ratio of the distance to the spot size (8.5.2 Optic diagram) and the field of view. The area of the surface measured by the device increases as the distance between the device and the object increases.

8.5.1 Laser sighting

Laser sighting is part of the Ex-MX2, The laser sight allows very precise targeting and is indispensable for sighting on small or far away objects. The 3 point laser marking shows the exact size of the measuring spot. The equipment is equipped with a robust solid-state laser which is installed inside the device.

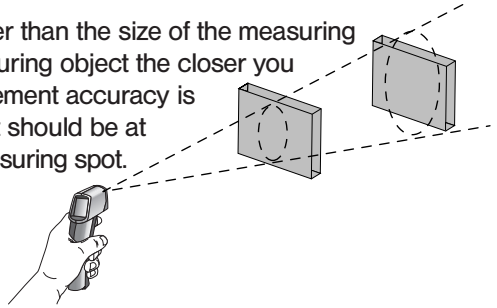
Please read Section 5 Safety instructions carefully for information about laser warnings.

8.5.2 Optical diagram



8.5.3 Field of view

Ensure that the measuring object is larger than the size of the measuring spot of the device. The smaller the measuring object the closer you must approach the object. If the measurement accuracy is crucially important, the measuring object should be at least twice as large as the size of the measuring spot.



9. Changing the battery

If the battery is discharged and only a reserve operating time remains, the battery symbol appears on the display. The battery should be replaced afterwards in order to ensure safe operation.

The battery must only be changed outside the Ex-zone. When changing the battery, it must be ensured that only the batteries listed in the operating instructions are used. The use of other batteries is strictly forbidden.

You must remove the leather holster to open the battery compartment. The battery compartment can now be opened. Replace the used batteries and absolutely ensure **that the polarity is correct**. After replacement, the leather holster must be put on again as this is necessary for use in the Ex-area.

- Always replace all of the batteries together.
- Make sure that the polarity of the inserted batteries is correct.
- Please ensure that all used batteries are properly disposed of in an environmentally friendly manner.



10. Troubleshooting

Code	Fault	Procedure
- O -	Target temperature is above the measuring range	Select target within the range
- U -	Target temperature is below the measuring range	Select target within the range
E-EPROM-Err	E-EPROM fault	Contact the manufacturer
CalAreaErr	Calibration error	Contact the manufacturer
ProbCalErr	Calibration error	Contact the manufacturer
Blank display	Weak or empty batteries	Replace batteries
Battery symbol is displayed	Batteries are almost empty	Check or replace batteries
Laser does not function	Weak or discharged batteries or ambient temperature >+45 °C	Replace batteries, ensure that ambient temperature ≤ +45 °C.

11. Repairs

Repair work is subject to the nationally valid regulations and directives. We therefore recommend that such work be performed by ecom instruments GmbH, Germany, as all repairs must be examined to ensure functional safety.

12. Cleaning, maintenance and storage

- Only use a suitable cloth or sponge to clean the unit. Do not use solvents or abrasive cleaning agents, particularly the lens, for cleaning.

Cleaning the lens:

Blow off loose particles with clean air. Remaining contamination is then removed carefully with a soft brush. Wipe the surface carefully with a moist swab. The swab can be moistened with water.

- We recommend having the function and the accuracy of the device checked by the manufacturer every two years.
- The batteries should be taken out of the unit if it is to be stored for extended periods.
- The storage temperature should be within the permitted range of -20 °C to +50 °C (without batteries).

13. Disposal

Old electrical equipment and „historic“ old electrical equipment from ecom instruments GmbH will be disposal obligation and disposed of at no cost in accordance with the EC Directive 2002/96/EC and the German Electrical and Electronic Equipment law of 16/03/2005. The costs of the transport of the equipment to ecom instruments GmbH are borne by the sender.

14. Warranty and liability

Under the general terms and conditions of business, ecom instruments GmbH offers a 2-year warranty for function and materials on this product under the specified operating and maintenance conditions. Not covered are all wearing parts (such as batteries and lamps).

This warranty does not extend to products that have been used improperly, altered, neglected, damaged by accident or subjected to abnormal operating conditions or improper handling.

In the event of a warranty claim, the faulty device should be sent in. We reserve the right to readjust, repair or replace the unit.

The above warranty terms represent the sole rights of the purchaser to compensation and apply exclusively and in place of all other contractual or statutory warranty obligations. ecom instruments GmbH does not accept liability for specific, direct, indirect, incidental or consequential damages or losses, including the loss of data, regardless of whether they are caused by breach of warranty, lawful or unlawful actions, actions in good faith or other actions.

If in certain countries the restriction of statutory warranty and the exclusion or restriction of incidental or consequential damages is unlawful, then it may be possible that the above restrictions and exclusions do not apply for all purchasers. If any clause in these warranty terms should be found to be invalid or unenforceable by a competent court, then such a judgement shall not affect the validity or enforceability of any other clause contained in these warranty terms.

15. EC Declaration of conformity

Further details relating to the declaration of conformity can be found at the following Website <http://www.ecom-ex.com> in the Products Download area.

16. EC-Type Examination Certificate

- (1) **EC-Type Examination Certificate**
- (2) Equipment and Protected Systems Intended for Use in Potentially Explosive Atmospheres – **Directive 94/9/EC**
- (3) **TÜV 00 ATEX 1597 X**
- (4) Machine: Explosion protected temperature measuring device type Ex-MX2
- (5) Manufacturer: ECOM Rolf Nied GmbH
- (6) Address: D-97959 Assamstadt, Industriestraße 2
- (7) The design of this equipment and its various approved embodiments are defined in the attachment to this type examination certificate.
- (8) The TÜV Hannover/Sachsen-Anhalt e.V, TÜV CERT certification body, notified body no. 0032 in accordance with Article 9 of the EC Council Directive dated March 23, 1994 (94/9/EC), certifies that this equipment has been found to conform with the essential health and safety requirements for the design and construction of equipment and protected systems for proper intended use in potentially explosive areas in accordance with Appendix II of the directive. The results of the test are documented in the confidential test report no. 00 PX 16900.
- (9) The essential health and safety requirements are met by virtue of conformity with

EN 50 014:1997

EN 50 020:1994

- (10) If the certification number is followed by an “X”, then this indicates that special conditions exist for the safe operation of the equipment. These special conditions are contained in the attachment to this certificate.
- (11) This EC Type Examination Certificate refers only to the design and construction of the specified device according to the Directive 94/9/EC. Further requirements contained in this directive apply for the manufacture and marketing of this device.
- (12) The equipment must be labelled with the following information:

 **II 2 G EEx ia IIC T4**

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Hannover, 19/07/2000

The Director

This EC-type examination certificate may only be circulated without alteration.
Extracts or modifications require the permission of TÜV Hannover/Sachsen-Anhalt e.V.

APPENDIX

(13)

(14) **EC-type-examination certificate no.: TÜV 00 ATEX 1597 X**

(15) Description of the equipment

The explosion protected temperature measuring device type Ex-MX2 may be used within Category 2 or 3 potentially explosive areas (Zone 1 or 2).

The maximum permissible ambient temperature is 50 °C,

Electrical specifications

Power supply 2 alkaline manganese (Mignon) batteries according to IEC LR6/AA or R6/AA

(internal battery) U = 3 V

Only batteries successfully type-approved according to paragraph 10.9 of EN 50020:1994 are permitted. The manufacturers and types are listed in the operating instructions.

(16) Test documents are listed in Test Report No. 00 PX 16900.

(17) Special conditions

The battery must only be changed outside potentially explosive areas.

In potentially explosive areas, the temperature measuring device may only be operated in its leather pouch.

(18) Essential health and safety requirements
no additional requirements

**I. SUPPLEMENT
to the
EC Type Examination Certificate No. TÜV 00 ATEX 1597 X**

of the company: ECOM Rolf Nied GmbH
 Industriestraße 2
 D-97959 Assamstadt

The Ex-MX2 explosion-protected temperature measuring device may in future be manufactured in accordance with the documents listed in the Test Report.

The modifications concern the internal structure.

The electrical data, special conditions and all other details apply unchanged for this supplement.

16) Test documents are listed in Test Report No. 01 PX 01310.

(17) Special conditions

unchanged

(18) Essential health and safety requirements

no additional requirements

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle Am TÜV 1 D-30519
Hannover

Hannover, 19/01/01

The Director

**2. SUPPLEMENT
to the
EC Type Examination Certificate No. TÜV 00 ATEX 1597 X**

of the company: ecom instruments GmbH
Industriestraße 2
D-97959 Assamstadt

The Ex-MX2 explosion-protected temperature measuring device may in future be manufactured and operated in accordance with the documents listed in the test report.

The electrical data, special conditions and all other details apply unchanged for this supplement.

(16) Test documents are listed in Test Report No. 01 YEX 126578.

(17) Special conditions

The following also apply for measuring temperatures within Category 1 (Zone 0):

The Ex-MX2 temperature measuring device itself must not be brought into the Category 1 (Zone 0) area.

The device's carrying strap and leather pouch must be attached to the operator's belt or to a belt loop so that the device still maintains a safety distance of > 50 cm to the Category 1 (Zone 0) boundary area when it hangs freely on the carrying sling. Only carrying slings of the manufacturer may be used.

(18) Essential health and safety requirements

no additional requirements

TÜV Hannover/Sachsen-Anhalt e.V.
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Hannover, 25/07/01

The Director

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3. SUPPLEMENT
to the
EC Type Examination Certificate No. TÜV 00 ATEX 1597 X

of the company: ecom instruments GmbH
Industriestraße 2
D-97959 Assamstadt

The Ex-MX2 explosion-protected temperature measuring device may in future be manufactured and operated in accordance with the documents listed in the test report.

The modifications concern the internal structure.

The electrical data and all other details apply unchanged for this supplement.

(16) Test documents are listed in Test Report No. 03 YEX 551036.

(17) Special conditions

The battery must only be changed outside potentially explosive areas.

In potentially explosive areas, the temperature measuring device may only be operated in its leather pouch.

The following also apply for measuring temperatures within Zone 0:

The Ex-MX2 temperature measuring device itself must not be brought into Zone 0.

The device's carrying strap and leather pouch must be attached to the operator's belt or to a belt loop so that the device still maintains a safety distance of > 50 cm to the boundary area of Zone 0 when it hangs freely on the carrying sling. Only carrying slings of the manufacturer may be used.

(18) Essential health and safety requirements

no additional requirements

TÜV NORD CERT GmbH & Co. KG
TÜV CERT-Zertifizierungsstelle
Am TÜV 1
D-30519 Hannover

Hannover, 01/03/04

The Director