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Ex-MP4 a

Operating Instructions



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Note:

The current operating instructions, the EC Declaration of Conformity and the ex-certificate can be downloaded from the relevant product page at www.ecom-ex.com, or alternatively they can be requested directly from the manufacturer.

1. Application

The Ex-MP4 a is a non-contact temperature meter for industrial application in areas with an increased risk of explosion in zones 2 and 1, in accordance with directive 1999/92/EC (ATEX 137).

2. Safety precautions

These operating instructions contain information and safety regulations which are to be observed without fail for safe operation in the described conditions. Non-observance of this information and these instructions can have serious consequences or it may violate regulations.

Please read these operating instructions carefully before starting to use the unit!

In case of any doubt (in the form of translation or printing errors) the German language operating

3. Faults and damage

If there is any reason to suspect that the safety of the unit has been impaired, it must be withdrawn from use and removed immediately from the Ex-area.

Measures must be taken to prevent it from being restarted accidentally.

We recommend that the unit is returned to the manufacturer for inspection.

The safety of the unit may be compromised, if, for example:

- there is visible damage to the housing.
- the unit has been subjected to excessive loads.
- the unit has been improperly stored.
- the unit has been damaged in transit.
- unit markings or inscriptions are illegible.
- malfunctions occur.
- obvious measuring inaccuracies occur.
- it is not possible to conduct any more measurements with the unit.
- permitted limit values have been exceeded.

4. Safety regulations

Use of this unit assumes that the operator observes the conventional safety regulations and has read the certificate in order to eliminate faulty operation of the unit.

The following safety regulations must also be complied with:

- **The unit should not be opened inside the Ex-area.**
- **The battery should only be exchanged outside the Ex-area.**
- **Additional batteries must not be carried in the Ex-area.**
- **Only type-tested batteries should be used.**
- **The unit should only be operated in the explosive area while situated in the appropriate leather case 030280.**
- **Only accessories approved by ecom instruments GmbH may be used.**
- **Avoid use in aggressive acids or bases.**
- **It must be ensured that the unit is not taken into zone 0.**
- **The device is to be protected against water and dust ingress.**

4.1 Special conditions for conducting measurements in zone 0

The Ex-MP4 a should only be used to measure the temperature in zone 0 after consideration of the following conditions.

1. The Ex-MP4 a itself should not be taken into the zone 0 area.
2. It is imperative to make sure that the unit is not able to inadvertently enter the zone 0 area either. To ensure this the Ex-MP4 a unit must be used with the corresponding wrist strap.

Only the manufacturer's wrist strap should be used.

5. Safety precautions



- Caution! Laser radiation!
- Do not stare directly at the laser!
- Do not aim the unit at other people!
- Risk of eye damage!
- Laser class 2
- Power: < 1 mW
- Wavelength: 630 -670 nm

6. Ex-Data

EC type approval test certificate no.:

EPS 10 ATEX 1 242 X

Ex-designation:

Ⓔ II 2 G Ex ia op is IIC T4

Approved for zone 1, device group II, gas group C (explosive gases, vapours or mist), temperature class T4.

7. Specifications

Measuring range	-18 °C to + 400 °C
Ambient temperature Ta	0 ... +50 °C
Storage temperature	-20 °C to +65 °C
Relative humidity	10- 95 % r.h. non-condensing at 30 °C
Emission level	fixed at 0.95
Smallest display unit	0.2 °C
Target sighting	Laser
Accuracy	-18 °C ... -1°C ±3 °C
(at 23°C)	-1°C ... +400 °C : ±2 % of reading or ±2 °C, whichever is greater
Repeatability	± 2 % of reading or ±2 °C whichever is greater
Spectral response	7-18 µm
Response time (95%)	500ms
Batteries / power supply:	1 x 9V alkaline battery according to IEC 6LR61, type-tested

7.1 Table with type-tested batteries

Manufacturer	Model
Energizer	Energizer 522
Duracell	Plus Alkaline MN1604
Duracell	Procell Alkaline MN1604
Panasonic	Powerline Industrial Alkaline 6LR61
Panasonic	Xtreme Power 6LR61

Dimensions: 152 x 101 x 38 mm

Weight: approx. 200g

CE-designation: C € 0102

8. Functional description / operating instructions

Please read these operating instructions carefully so that you are familiar with, and are able to use, all of the functions of your Ex-MP4 a. For your own safety and information please read through the instructions on the following pages!

8.1 Mode of operation

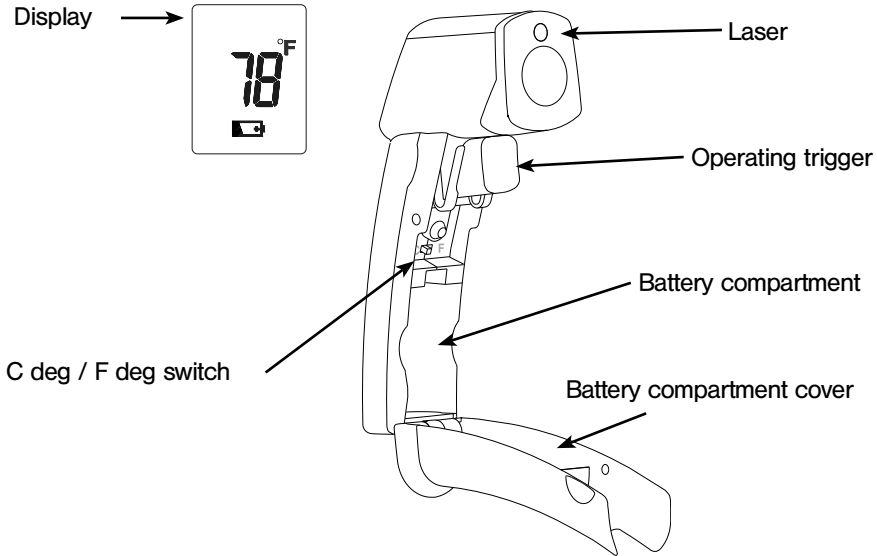
All objects with a temperature above absolute zero radiate infrared energy, which extends in every direction with the speed of light. If an infrared thermometer is trained on an object, the lens gathers the energy and focuses it on an infrared sensor.

The sensor responds by emitting a voltage signal which is directly proportional to the absorbed energy. The microprocessor-controlled electronics in the unit are able to ascertain and display the current temperature (in regard to a wider parameter).

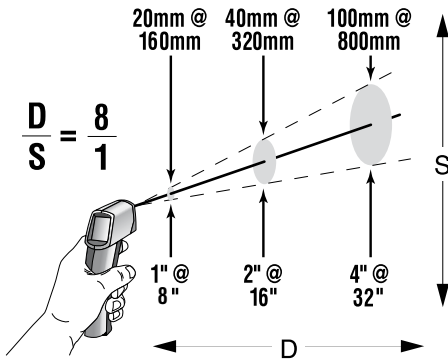
Objects with radiant or polished surfaces not only radiate energy but also reflect a proportion of radiation from their surrounding area. A factor between 0.1 and 1.0 designated as the emission level makes allowances for this factual calculation so that only the true radiated energy, and not the reflected energy, is consulted for calculating the measured value. The majority of applications are measured with an emission level of 0.95.

In the Ex-MP4 a the level is set at 0.95 and cannot be altered.

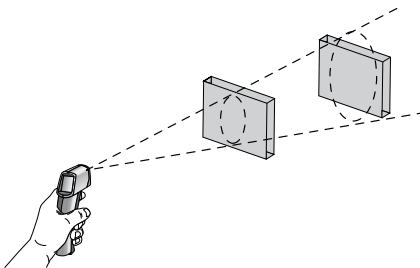
8.2 Structural overview



8.3 Optical diagram and field of sight



Distance sensor – object [mm]



Ensure that the specific area or object to be measured is larger than the laser spot size of the device. The smaller the object the closer the equipment must be. For optimum measuring accuracy the area/object should be at least twice that of the spot size.

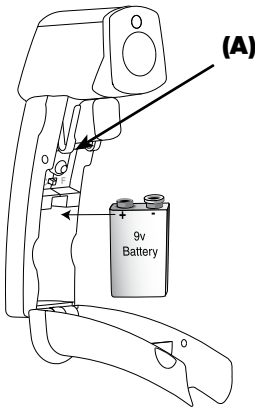
8.4 Operation of the laser sight

The laser sight is a component of the Ex-MP4 a.
Please read through the following section carefully:

Warning! Do not stare directly at the laser!
Risk of eye damage!
Operate the unit carefully!
Do not aim the unit at other people!

The laser sight enables the unit to be aimed accurately and is useful for sighting small or distant objects. However it does not indicate the size of the spot. This value is distance-dependent and can be inferred from the optical diagram in this manual.
The units are equipped with a robust solid state laser which is housed inside the unit itself.

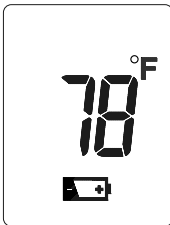
8.5 Operating the unit



C deg / F deg Change-over

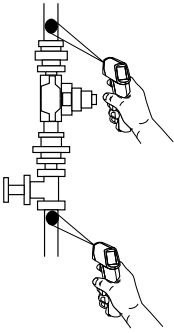
In order to switch between centigrade and fahrenheit, the battery compartment has to be opened – having first taken off the leather case. It is then possible to select the temperature indicator required by sliding Switch **A** from either degree C or degree F.

After selecting the temperature indicator required the leather case must again be fitted before operation of the equipment in the hazardous area.



The LCD indicator shows the temperature in degrees C or degrees F. After release of the trigger the temperature measurement is displayed for a further 7 seconds and at the same time the word "Hold" is displayed. The battery condition indicator symbol shows the state of the battery.

Operation of the Device



For a temperature reading, the equipment is pointed towards an object and the trigger is pressed. Consider the distance in relation to the spot size at this point (optical diagram) as well as taking the field of sight into consideration. With increased distance from the object, increase the surface of the measured area of equipment.

8.6 Emission level

The majority of organic materials, as well as coated and oxidised surfaces, possess an emission level of 0.95. For this reason the emission level of the Ex-MP4 a has been set to 0.95 and cannot be altered.

When determining the temperatures of shiny or highly polished metallic surfaces inaccurate measurements are produced. To compensate this effect the object being measured can be covered with adhesive tape or coated with matt black paint. Wait until the adhesive tape is the same temperature as the underlying material. Then determine the temperature of the tape (which is equivalent to the material) or the coated surface.

8.7 Battery replacement

If the battery is depleted and only a residual charge remains, the battery symbol appears on the display. If this occurs the battery should be changed in order to ensure safe operation. The battery should only be exchanged outside the Ex-area. When changing the battery make sure that only those batteries specified in this manual are used (see point 7.1:Table with type-tested batteries). The use of different batteries is strictly prohibited! To open the battery compartment first remove the leather case from the handle. The compartment can now be opened. You can then remove and exchange the battery. When the battery has been replaced the leather case must be refitted over the handle.

- Pay attention to the correct polarity.
- Dispose of depleted batteries in an appropriate and environmentally friendly manner!

8.8 Troubleshooting

Code	Malfunction	Procedure
- - - (on the display)	Target temperature above or below the measuring range	Select target within the range
Battery symbol appears	Battery virtually depleted	Check or replace the battery
No display	Battery discharged	Check or replace the battery
Laser does not function	Weak or discharged battery	Replace battery

9. Repair

Repairs are to be conducted by ecom instruments GmbH or by personnel or service centres authorised by ecom instruments GmbH, because the safety of the unit needs to be tested after repairs are implemented.

10. Disposal

Old electrical devices as well as "historical" old electrical devices from ecom instruments GmbH are supplied for disposal at our expense and disposed of free of charge in accordance with European Directive 2002/96/EC and the German electrical law of 16/03/2005. The costs associated with returning devices to ecom instruments GmbH are to be borne by the sender.


In accordance with Article 1, Section 18 and Article 2 of the Act revising the law of Waste-Related Product Responsibility for Batteries and Accumulators (Gesetz zur Neuregelung der abfallrechtlichen Produktverantwortung für Batterien und Akkumulatoren) dated 25 June 2009, we are obligated to provide the following information.

Your device contains an alkaline battery.

Depleted batteries should never be disposed of along with normal or household waste. Old batteries can contain harmful substances that are hazardous to health and damaging to the environment. Please return the batteries. Return is free of charge and required by law. Please only dispose of discharged batteries in the designated containers.

Note: The battery used in this unit poses a fire hazard and can cause chemical injuries if it is used improperly. Neither the battery nor the battery cells should be opened or disassembled and they should not be burned or exposed to temperatures exceeding 100°C.

If the battery needs to be disposed of, it can be removed as described under point (8.7). The disposal regulations specified above are also applicable for old devices. All batteries can be recycled. Precious raw materials such as iron, zinc and nickel can therefore be reused.

The symbol  has the following meaning: Batteries and rechargeable batteries should not be disposed of along with normal or household waste.

11. Cleaning, maintenance and storage

- Only use a suitable cloth or sponge to clean the unit. Do not use any solvents or abrasive cleaning agents when cleaning.
- It is recommended that you have the functionality and accuracy of the unit inspected by the manufacturer every two years.
- The battery should be removed from the unit during prolonged periods of storage.
- Do not allow storage temperatures to exceed or fall below the permitted range of -20 °C to +65 °C!

12. Warranty and liability

In accordance with our general terms and conditions ecom instruments GmbH provides a warranty for this product for a period of two years regarding its function and material under the specified and permitted operating and maintenance conditions. This excludes all parts that are subject to wear and tear (e.g. batteries, probes, calibration units, LEDs, etc.).

This warranty does not extend to products that are used improperly, have been modified, neglected, damaged in accidents or exposed to abnormal operating conditions and inappropriate handling.

Any claims under the warranty can be invoked by returning the defective equipment to the manufacturer. We reserve the right to repair, adjust or exchange the device.

The aforementioned warranty conditions are the sole and only right of the purchaser to compensation, are exclusively valid and replace all other contract or legal warranty obligations. ecom instruments GmbH assumes no liability for special, direct, indirect, accompanying or consequential damage as well as losses including the loss of data, independent of whether it was caused by violation of the warranty obligation, lawful or unlawful action, action in good faith or any other action.

If the limitation of a legal warranty as well as the exclusion or limitation of accompanying or consequential damage is not permissible in certain countries, it may be that the aforementioned limitations and exclusions are not valid for every purchaser. Should any such clause of these warranty conditions be declared ineffective or unenforceable by a competent court, then the effectiveness or enforceability of any of the other conditions of these warranty conditions shall remain unaffected by such a judgement.

13. EC Declaration of Conformity

Further details regarding the Declaration of Conformity can be found at:
<http://www.ecom-ex.com> in the product download area.

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