EPIC® SENSORS TEMPERATURE SENSORS
- GENERAL SAFETY NOTES

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Document history

Version	Date	Update by	Subject
EN-0.1	10.9.2020	Lapp / JuPi	Original text
EN-0.2	16.9.2020	Lapp / JuPi	Reference to Ex product certificates added
EN-0.3	9.10.2020	Lapp / JuPi	Type label information added
EN-0.4	18.2.2021	Lapp / JuPi	Type label information updated
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GENERAL INFORMATION

These safety notes are written to give general information for safe use of EPIC® SENSORS temperature sensors. Although having considered our long experience on the technology and use cases we have learned of, this information alone is not enough. This information should always be used along with technical data, manuals, local safety regulations, professional installation practices, and case-by-case advice by specialists.

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EPIC® SENSORS temperature sensors are manufactured according to an ISO 9001:2015 certified quality management system. The production is executed with state-of-the-art technology, working procedures, and uncompromising workmanship. Additionally, our production is ATEX and IECEx quality assurance reported for production of sensors to be used in potentially explosive (Ex) areas.

Detailed technical data, including type-specific allowed temperature ranges of these sensors is available on individual datasheets of each type. If the sensor type is certified, for example Ex-approved, the certificate gives special advice of safe use. Any information needed, the above mentioned or more, will be made available if needed.

Technical data, datasheets and other documents are freely available for download from our web service:

www.epicsensors.com

The standard product structures of our sensor range are commonly used in industrial instrumentation, and most of them are based on DIN standards. The DIN standard reference for each sensor type is presented on datasheet.

EPIC® SENSORS temperature sensors are manufactured and intended for temperature measurement only. It is not allowed to misuse them for anything else than the intended use. Any changes to product structure will void the warranty.

EU DECLARATION OF CONFORMITY (EU DoC)

Conformity to European Directives is declared with applicable documents according to product type:

- For standard (non-Ex) sensors the EU DoC contains reference to RoHS Directive conformity.

- For ATEX-approved Ex-sensors there are separate EU DoC documents for each type, referring to RoHS and ATEX directives, applicable standards, and certificates.

An EU DoC copy is delivered with the product or on request. For contact info, please see section MANUFACTURER.

INSTALLATION

The installation supervisor should ensure, that the installer has read and understood these safety notes. Installations not in comply with these safety notes, will void the warranty. General warranty terms can be found attached to this document.

EPIC® SENSORS temperature sensors are measuring devices intended for professional use. They should be mounted by professionally capable installer who understands the installations surroundings. The worker should understand mechanical and electrical needs and safety instructions of the object installation. Suitable safety gear for each installation task must be used.

Consider the specific features of the object before mounting or removing sensors:
- Sensors usually are intended for places with need for temperature monitoring, so it is natural that there may be very high or very low temperatures present.
- In many cases the media to be measured can be dangerous or harmful for humans.
- In pressurized systems the installations should be done according to pressure device directives.
- In potentially explosive areas the installation methods must comply with regulations of the applicable Ex zone classification. For many Ex-approved sensors, the Ex product certificate, part *Specific conditions of use* gives further instructions to follow. Ex product certificates can be downloaded from our web service, please visit: www.epicsensors.com.

MAKE SURE, THAT THE OBJECT IS MADE SAFE TO WORK WITH!

Do not subject sensors to shocks or mechanical stress. Sensors are not to be bended or folded if there are no special instructions how to do it. Some sensor types can be moderately bent during installations. Regarding cable sensor types, the minimum bending radius of the cable must be considered.

Threaded sensor types, which are connected to process thread, must be installed considering the maximum tightening torque. Different thread sizes have their own tightening torque values according the applicable standards.

Sensors with connection head have either a ceramic connection block or a temperature transmitter installed inside. Both the block and transmitter connection screws should be tightened considering the maximum tightening torque given on their data. The connection head (enclosure) ingress protection degree (IP class) should be considered when choosing suitable cable glands for outside diameter of the cables. Extra gland holes must be reliably closed with blind plugs of suitable IP class. Always use cable gland types or other measures which provide reliable strain relief.

Ceramic protection tubes must be protected from mechanical loads, which occur specially in case of horizontal mounting positions. An additional support for horizontal mounting must be provided, depending on the diameter, nominal length, and design. Generally, it is recommended to use vertical mounting positions with ceramic protective tubes and with long metallic protective tubes.

CONNECTIONS

EPIC® SENSORS temperature sensors are mainly resistance (RTD) or thermocouple (TC) sensors. For all of them the connection information is given on the sensor datasheets. Should the sensor be delivered with a transmitter assembled, the connection information can then be found on the transmitter datasheet or user manual. Connections of sensors or transmitters for potentially explosive areas – Ex devices – should be commissioned according to regulations of applicable Ex zone classification.

Some of the thermocouple sensor types are grounded structures. In these types the hot junction between thermo materials is galvanically connected (grounded) with the protective tube. Grounded types cannot be connected to same circuits with non-grounded ones. Always make sure which type is applicable for the circuit.

Resistance and thermocouple sensors and temperature transmitters are all components intended for low current measuring circuits. If you are not sure of the correct connection, do not connect sensor to measuring circuit.

NEVER CONNECT MAINS POWER TO SENSORS!
MAKE SURE, THAT THE CABLE SHEAT AND WIRE INSULATIONS ARE FAULTLESS!

CONSIDERING TEMPERATURES

The object to be measured and its temperature determine the appropriate sensor type. The allowed measuring ranges are given on the sensor datasheets. Additionally, the ambient temperature must be considered.

Usually, only the sensor tip is high temperature proof, and the parts left outside the process pipeline, for example, should be engineered with such dimensions, that they have distance enough to high temperatures. Regarding cable sensor types, the interconnection part between sensor protective tube and cable must be specially considered. And of course, temperature range of the cable itself.

For resistance temperature sensors (RTD) the maximum measuring temperature varies typically between +450…+600 °C, regarding the measuring resistance type and sensor structure.

For thermo couple sensors (TC) the maximum measuring temperature varies typically between +750…+1600 °C, regarding the thermo couple type and sensor structure.

NEVER MEASURE TEMPERATURES OVER THE MAXIMUM ALLOWED!

Higher measuring temperatures should always be investigated separately.

Specially consider ceramic thermowells if immersion must be done into a hot process. Ceramic thermowell materials withstand only limited heat fluctuations. A temperature shock can cause stress cracks and damage the protection tube. Thermocouples with ceramic protection tubes should be preheated before installation, and only then slowly immersed.

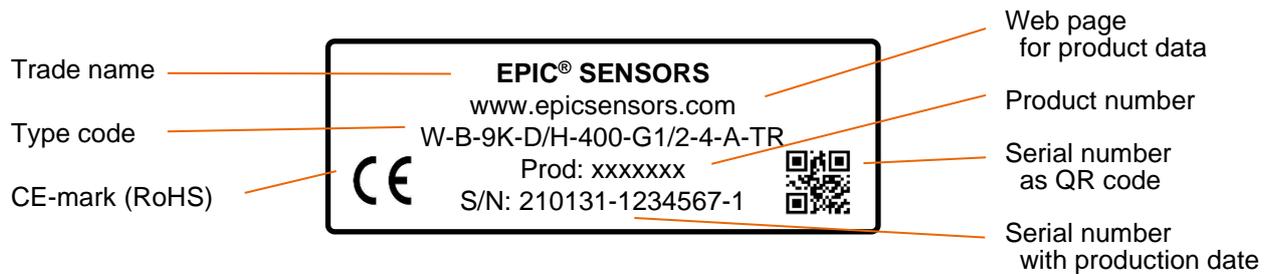**A THUMB RULE: HIGHER PROCESS TEMPERATURE – LOWER INSERTING SPEED.**

Recommended immersion speeds for ceramic protection tubes (acc. to DIN 43724):
- 1 cm/min for protection tubes with diameters of 24/26 mm
- 50 cm/min for protection tubes with diameters of 15 mm
- 100 cm/min for protection tubes with diameter of 10 mm.
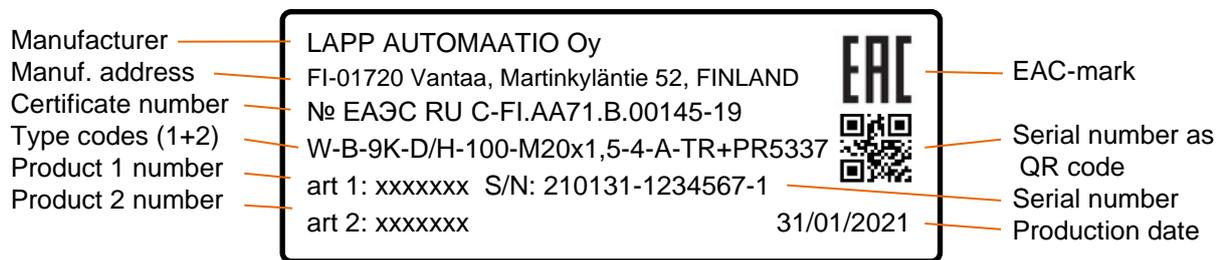
TYPE LABELS OF STANDARD SENSORS (NON-EX)

Each sensor has a type label attached to. It is a moisture and wear proof industrial grade sticker, with black text on white label. This label has printed information of trade name, web page, type code, CE-mark, product number and serial number, including production date. For these sensors, manufacturer contact information is printed on a separate label.

Image below: Example of a non-Ex sensor type label.

Trade name — **EPIC® SENSORS**

Web page for product data

Type code — www.epicsensors.com W-B-9K-D/H-400-G1/2-4-A-TR

Product number

CE-mark (RoHS) — CE Prod: xxxxxxx

Serial number as QR code

S/N: 210131-1234567-1

Serial number with production date

For EAC EMC-approved, sensor+transmitter combination versions, exported to Eurasian Customs Union area, there is a special type label.

Image below: Example of an EAC EMC-approved product type label, including sensor (1) and transmitter (2).

Manufacturer — LAPP AUTOMAATIO Oy
Manuf. address — FI-01720 Vantaa, Martinkyläntie 52, FINLAND
Certificate number — № ЕАЭС RU C-FI.AA71.B.00145-19
Type codes (1+2) — W-B-9K-D/H-100-M20x1,5-4-A-TR+PR5337
Product 1 number — art 1: xxxxxxx S/N: 210131-1234567-1
Product 2 number — art 2: xxxxxxx   31/01/2021

EAC-mark

Serial number as QR code

Serial number

Production date

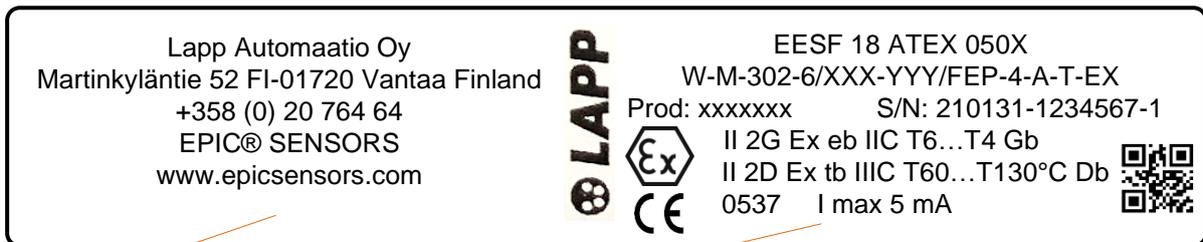## SERIAL NUMBER INFORMATION

Serial number S/N is always printed on type label in the following form: yymmdd-xxxxxxx-x:

- yymmdd   production date, e.g. "210131" = 31.1.2021
- -xxxxxxx   production order, e.g. "1234567"
- -x   sequential ID number within this production order, e.g. "1"

TYPE LABELS OF EX-APPROVED SENSORS

For ATEX, IECEx and KCs Ex-approved versions there is more information on the label, according to applicable standards. This label has printed information as presented below.

Image below: Example of an ATEX Ex e approved sensor type label.

Lapp Automaatio Oy
Martinkyläntie 52 FI-01720 Vantaa Finland
+358 (0) 20 764 64
EPIC® SENSORS
www.epicsensors.com

EESF 18 ATEX 050X
W-M-302-6/XXX-YYY/FEP-4-A-T-EX
Prod: xxxxxxx   S/N: 210131-1234567-1
II 2G Ex eb IIC T6…T4 Gb
II 2D Ex tb IIIC T60…T130°C Db
0537   I max 5 mA

Manufacturer contact information. For some sensor types, this may also be printed on a separate label for practical reasons.

Ex certificate number(s)
Type code
Product number   Serial number with production date
Ex-mark (ATEX)   Ex markings
CE-mark (ATEX and RoHS)   Serial number
Notified body number   as QR code
Special technical values (if needed)

For EAC Ex-approved sensor versions, exported to Eurasian Customs Union area, there is a special type label.

Image below: Example of an EAC Ex-approved sensor type label.

Manufacturer
Manuf. address
Ex certificate number
Type code
Product number
Ex marking

LAPP AUTOMAATIO Oy
FI-01720 Vantaa, Martinkyläntie 52, FINLAND
№ ЕАЭС RU C-FI.AA71.B.00130-19
T-M-303-6/XXX-YYY/FDS-Z-1-Ex
art: xxxxxxx   S/N: 210131-1234567-1

1Ex e IIC T6...T4 Gb X   Ex tb IIIC T60°C...T130 °C Db X   31/01/2021

EAC Ex -mark
Serial number as QR code
Serial number
Production date

MATERIALS

EPIC® SENSORS temperature sensors are manufactured with generally used materials, which are given on the datasheets. Material versions for special applications must always be inquired individually.

Sensors protective tube and thermowell temperature ranges are given on datasheets. Only use materials defined for the process temperatures. Never measure temperatures over the maximum allowed. Also, the protective tubes and thermowells are subject to mechanical abrasion and chemical corrosion caused by the process media. Do not install sensors or thermowells to processes if you are not aware of the material combability with the process mechanics or with the measured process media.

Ceramic protective tubes of some thermocouples are fragile components used in excessive temperature, chemical and mechanical loads. There is no way to estimate the lifetime of them installed into processes. That is why ceramic tubes are considered as wear parts, which are not covered by our warranty terms.

Our experts can help you if needed, but the final material choice is a decision of the responsible process operator/manager.

The materials of connection heads (enclosures) and cables should be chosen considering ambient circumstances, such as chemical load, temperature, and bending features (cable).

The materials of standard types of our temperature sensor product range are not harmful nor dangerous for human health. To express this, there is a RoHS reference on an EU Declaration of Conformity. No separate material data sheets (MSDS) is needed. If a special structure with listed materials, according to customer order, should be manufactured, then all relevant documents will be created separately.

MANUFACTURER and FURTHER INFORMATION

Lapp Automaatio Oy
Martinkyläntie 52
FI-01720 Vantaa, Finland

For any repair or maintenance issues, please contact our Technical Sales:

Phone +358 20 764 6410

www.epicsensors.com

We reserve the right to change the contents without prior notice.

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ANNEX 1 – WARRANTY TERMS

**General Warranty Terms and Conditions of
Lapp Automaatio Oy for EPIC SENSORS® temperature sensors**

1. Scope of application
These warranty terms and conditions are applied to all deliveries of EPIC SENSORS® temperature sensors (hereinafter "Product") sold or marketed by Lapp Automaatio Oy (hereinafter "Supplier") to another party (hereinafter Customer), and to all related offers, orders, order confirmations and agreements, unless otherwise specifically agreed in the agreement.

2. Warranty period
The product warranty is five (5) years from the moment the Products have been delivered to the Customer, unless otherwise agreed in writing.
The warranty period for Products that have been repaired or replaced under the warranty will continue until the end of the original warranty period.

3. Contents of the warranty
The Supplier warrants that the Products fulfil the agreed specifications and that they are suitable for their ordinary purpose of use. The warranty covers manufacturing and material defects in the Products.
Based on the warranty, the Supplier, during the warranty period, repairs faults the Supplier is informed about and that are covered by the warranty. Warranty repairs are carried out during the Supplier's standard working hours. The Supplier, at its own discretion, can either repair the faulty Product or deliver a new Product to the Customer. The ownership of the original Products and Product parts replaced based on the warranty is transferred to the Supplier. The Customer is responsible for the costs incurred from shipping the faulty Products to the Supplier, and the Supplier is responsible for the costs incurred from shipping the replaced or repaired Products to the Customer. In the event that it becomes evident that the fault reported by the Customer is not covered by the warranty, the Supplier, in accordance with its valid price list, is entitled to charge the costs it has incurred when investigating the fault.

4. Limitations of warranty
The warranty is conditional on the Customer delivering the faulty Product to the Supplier and providing an adequate clarification, including the delivery date, order references, fault description and a description of the operating conditions of the Product.

The warranty does not cover:
(i) faults in those Product parts that are in direct contact with the process (such as the outer casing of the equipment), or parts that are exposed to chemicals used in the process, chemical compounds generated during the process, combustion gases, mechanical tear and wear or other such stress;
(ii) faults that are caused by circumstances or events outside the Supplier's control, such as errors in installation, maintenance or operation at the Customer's side;
(iii) faults resulting from the Customer selecting a Product or material that is not suitable for the use;
(iv) faults that have occurred in operating conditions that can be deemed to be unusual;
(v) faults that are caused by wear and tear that is deemed to be ordinary (for example, batteries and lamps);
(vi) any disassembly or installation costs or other such expenses; or
(vii) compensation for indirect or direct damages caused by the fault.
The warranty terms and conditions of the relevant software supplier are applied to any software included in the Products.
The Supplier's warranty is only applied to the Customer, not to any third parties.

5. Governing law and dispute settlement
These warranty terms and conditions are governed by the Finnish law.
The parties aim to settle all disputes arising out of or relating to these warranty terms by negotiation. Unless agreed otherwise, any disputes shall be finally settled by arbitration in accordance with the Arbitration Rules of the Finland Chamber of Commerce. The number of arbitrators shall be one.

6. Validity
These warranty terms and conditions are valid from 1st November 2015 until further notice.