Translation

1 # EU-Type Examination Certificate

2 **Directive 2014/34/EU of the European Parliament and of the Council of 26 February 2014**

3 EU-Type Examination Certificate Number: **BVS 14 ATEX E 147 X** Issue: **01**

4 Equipment: **Miniatur Widerstandsthermometer type TR21-*, TR31-*, and TR34-***

5 Manufacturer: **WIKA Alexander Wiegand SE & Co. KG**

6 Address: **Alexander-Wiegand-Straße 30, 63911 Klingenberg, Germany**

7 This product and any acceptable variations thereto are specified in the appendix to this certificate and the documents referred to therein.

8 DEKRA Testing and Certification GmbH, Notified Body number 0158, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, 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.

The examination and test results are recorded in the confidential Report No. BVS PP 14.2221 EU.

This issue of the EU-Type Examination Certificate replaces the previous issue of the EC-Type Examination Certificate BVS 14 ATEX E 147 X.

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

EN IEC 60079-0:2018	**General requirements**
IEC 60079-11:2023	**Intrinsic Safety "i"**
EN 60079-26:2015	**Equipment with Equipment Protection Level (EPL) Ga**

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the "Specific Conditions of Use" listed under item 17 of this certificate.

11 This EU-Type Examination Certificate relates only to the technical design of the specified product in accordance to 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 1G Ex ia IIC T1…T6 Ga	**II 1D Ex ia IIIC T_{200} x °C Da**
II 1/2G Ex ia IIC T1…T6 Ga/Gb	**II 1/2D Ex ia IIIC Tx °C Da/Db**
II 2G Ex ia IIC T1…T6 Gb	**II 2D Ex ia IIIC Tx °C Db**

DEKRA Testing and Certification GmbH
Bochum, 2026-06-02

Signed: Oliver Brumm

Managing Director

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13 **Appendix**

14 **EU-Type Examination Certificate**

BVS 14 ATEX E 147 X issue 01

15 **Product description**

15.1 **Subject and type**

Miniature resistance thermometers type TR21-*, TR31-* and TR34-*

Overview of all model series TR21-*, TR31-*, and TR34-*

TR21-A-*:

Based on TR34, assembled with thermowell and flange connection for sanitary applications.

TR21-B-*:

Based on TR34, assembled with thermowell for orbital welding in sanitary applications.

TR21-C-*:

Based on TR34, with directly welded flange connection for sanitary applications.

TR31-*:

Based on TR34, for special applications, special features (i. e. permanently connected cable) direct mounting into the process via thread connection.

TR34-*:

Miniature resistance thermometer for general industrial application, direct mounting into the process via thread connection (note: basic product for all assemblies).

Note:

Fields marked with an asterisk (*) are not Ex-relevant and may be followed by additional numbers or letters, separated by a hyphen (-).

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Model series TR21-*

TR21	-	X	-	XXX	-	X…X
a	-	b	-	cde	-	*…*

The asterisks "*" are not ex-relevant.

a Series:

TR21

b Design:

A = thermowell with flange connection
B = thermowell for orbital welding
C = with direct welded flange connection

c Explosion protection:

A = ATEX
B = ATEX und IECEx
C, D, E, F, G, H, I, J, K, O, W, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9
= reserved characters for other approvals additional to ATEX and IECEx
Z = Non Ex

d Preselecting output signal:

P = Pt100
R = Pt1000
T = 4…20 mA

e Output signal:

T = 4...20 mA, digital transmitter, 2-wire (standard sensor)
B = 4...20 mA, digital transmitter, 2-wire (sensor face-sensitive)
* = Pt100 (2 -, 3 - or 4-wire, sensor class, standard sensor or face-sensitive)
* = Pt1000 (2 -, 3 - or 4-wire, sensor class, standard sensor or face-sensitive)

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Model series TR31-*

TR31 - X - X - XX - X…X
a - b c - de - *…*
The asterisks "*" are not ex-relevant.

a Series:

TR31

b Design:

3 = Standard design connector M12
K = Permanently connected cable

c Explosion protection :

A = ATEX
B = ATEX and IECEx
C, D, E, F, G, H, I, J, K, O, W, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9
= reserved characters for other approvals additional to ATEX and IECEx
Z = Non Ex

de Output signal:

TT = 4...20mA
P* = Pt100 (2 -, 3 - or 4-wire)
S* = Pt1000 (2- wire)

Model series TR34-*

TR34 - X - XX - X…X
a - b - cd - *…*
The asterisks "*" are not ex-relevant.

a Series:

TR34

b Explosion protection :

A = ATEX
B = ATEX and IECEx
C, D, E, F,G, H, I, J, K, O, W, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9
= reserved characters for other approvals additional to ATEX and IECEx

cd Output signal:

TT = 4...20mA
P* = Pt100 (2 -, 3 - or 4-wire)
S* = Pt1000 (2-wire)

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15.2 Description

The miniature resistance thermometers series TR21-*, TR31-*, TR34-* are used for transformation of a temperature signal into a proportional electrical signal. All models consist of a metallic enclosure with a welded sensor probe. Inside the probe a temperature sensor (RTD) is fastened. The electrical connection of the external intrinsically safe circuit is made by a connector.

All models are equipped with a temperature sensor (RTD = resistance temperature detector), e.g. Pt100 or Pt1000. The sensor may be connected to the electrical output directly or there is optional a built in intrinsically safe 4…20 mA electronic unit between the temperature sensor and the electrical output. All models consist of the same parts, such as the enclosure, electronic unit, sensors, etc.

Reason for this issue:

- Minor changes of the parameters.
- Removal of the "ib-marking" from the marking plate.
- Minor modifications to the electronic circuit and mechanical design.
- Supplementary thermal assessment regarding temperature measurements with a dust layer.
- Update to standard editions: EN IEC 60079-0:2018, IEC 60079-11:2023 and EN 60079-26:2015.
- Editorial revisions to the manufacturer's documentation and general updates to the bill of materials.

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15.3 Parameters

15.3.1 Intrinsically safe supply and signal circuit

15.3.1.1 Models with built-in transmitter (4…20 mA current loop)

Applicable to the following model series:
TR34-*-TT-*, TR31-*-*-TT-*, TR21-*-*TT-*, TR21-*-*TB-*

Parameters	Gas applications	Dust applications
Terminals	+ / -	+ / -
Voltage U_i	DC 30 V	DC 30 V
Current I_i	120 mA	120 mA
Power P_i	800 mW	750/650/550 mW
Effective internal capacitance C_i	29.7 nF	29.7 nF
Effective internal inductance L_i	negligible	negligible

15.3.1.2 Models without built in transmitter (sensor connected directly)

Applicable to the following model series:
TR34-*-P*-*, TR34-*-S*-*, TR31-*-*-P*-*, TR31-*-*-S*-*, TR21-*-*P*-*, TR21-*-*R*-*

Parameters	Gas applications	Dust applications
Terminals	1 - 4	1 - 4
Voltage U_i	DC 30 V	DC 30 V
Current I_i	550 mA	250 mA
Power P_i	1500 mW	750/650/550 mW
Effective internal capacitance C_i	negligible	negligible
Effective internal inductance L_i	negligible	negligible

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15.3.2 **Marking, ambient temperature range and permissible process temperature**

Note applicable to all models, including models with and without built-in transmitter:

- The ambient temperature is not necessarily equal to the process temperature.
- The ambient temperature refers to the temperature at the connection head, connector, adapter and cable entry.
- The maximum process temperature shall not exceed +250°C.

15.3.2.1 Standard models with built-in transmitter, variants with M12x1 connector

Applicable to the following model series:
TR34-*-TT-*, TR31-3-*-TT-*, TR21-*-*TT-*, TR21-*-*TB-*

15.3.2.1.1 Applications requiring EPL Ga, Ga/Gb or Gb equipment

For Equipment Group II applications (explosive gas atmospheres), the following temperature classes and ambient temperature ranges apply.

Table 1 – Gas application with built-in transmitter, standard models

Marking	Temperature class	Ambient temperature range (T_a) at the connection side	Process temperature range at the tip of the probe or thermowell
II 1G Ex ia IIC T1 - T6 Ga II 1/2G Ex ia IIC T1 - T6 Ga/Gb II 2G Ex ia IIC T1 - T6 Gb	T6	-40 °C up to +45 °C	-50 °C … +68 °C
	T5	-40 °C up to +60 °C	-50 °C … +83 °C
	T4	-40 °C up to +85 °C	-50 °C … +118 °C
	T3	-40 °C up to +85 °C	-50 °C … +183 °C
	T2	-40 °C up to +85 °C	-50 °C … +250 °C
	T1	-40 °C up to +85 °C	-50 °C … +250 °C

15.3.2.1.2 **Applications requiring EPL Da, Da/Db or Db equipment**

For Equipment Group III applications (explosive dust atmospheres), the following surface temperatures and ambient temperature ranges apply.

Table 2 – Dust application with built-in transmitter, standard models

Marking	Permitted power (P_i)	Ambient temperature range (T_a) at connection side	Process temperature range at the tip of the probe or thermowell
II 1D Ex ia IIIC T_{200} x °C Da II 1/2D Ex ia IIIC Tx °C Da/Db II 2D Ex ia IIIC Tx °C Db	750 mW	-40 °C up to +40 °C	-50 °C … +(Tx °C – 14 K)
	650 mW	-40 °C up to +70 °C	
	550 mW	-40 °C up to +85 °C	

Tx (°C) is the permissible surface temperature

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15.3.2.2 Standard models with built-in transmitter, variants with permanently connected cable

Applicable to the following model series: TR31-K-*-TT-*

15.3.2.2.1 Applications requiring EPL Ga, Ga/Gb or Gb equipment

For Equipment Group II applications (explosive gas atmospheres), the following temperature classes and ambient temperature ranges apply.

Table 3 – Gas application with built-in transmitter, Model TR31-K

Marking	Temperature class	Ambient temperature range (T_a) at the connection side	Process temperature range at the tip of the probe or thermowell
II 1G Ex ia IIC T1 - T6 Ga II 1/2G Ex ia IIC T1 - T6 Ga/Gb II 2G Ex ia IIC T1 - T6 Gb	T6	-20 °C up to +45 °C	-50 °C … +68 °C
	T5	-20 °C up to +60 °C	-50 °C … +83 °C
	T4	-20 °C up to +80 °C	-50 °C … +118 °C
	T3	-20 °C up to +80 °C	-50 °C … +183 °C
	T2	-20 °C up to +80 °C	-50 °C … +250 °C
	T1	-20 °C up to +80 °C	-50 °C … +250 °C

15.3.2.2.2 Applications requiring EPL Da, Da/Db or Db equipment

For Equipment Group III applications (explosive dust atmospheres), the following surface temperatures and ambient temperature ranges apply.

Table 4 – Dust application with built-in transmitter, Model TR31-K

Marking	Permitted power (P_i)	Ambient temperature range (T_a) at connection side	Process temperature range at the tip of the probe or thermowell
II 1D Ex ia IIIC T_{200} x °C Da II 1/2D Ex ia IIIC Tx °C Da/Db II 2D Ex ia IIIC Tx °C Db	750 mW	-20 °C up to +40 °C	-50 °C … +(Tx °C − 14 K)
	650 mW	-20 °C up to +70 °C	
	550 mW	-20 °C up to +85 °C	

Tx (°C) is the permissible surface temperature.

Tx (°C) ≤ 2/3 x ignition temperature of a dust cloud

Tx (°C) ≤ Glow temperature of a 5 mm dust layer − 75 °C

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15.3.2.3 Standard models without built-in transmitter, variants with M12x1 connector (sensor connected directly to the electrical output)

Applicable to the following model series:
TR34-*-P*-*, TR34-*-S*-*, TR31-3-*-P*-*, TR31-3-*-S*-*, TR21-*-*P*-*, TR21-*-*R*-*

15.3.2.3.1 Applications requiring EPL Ga, Ga/Gb or Gb equipment

For Equipment Group II applications (explosive gas atmospheres), the following temperature classes and ambient temperature ranges apply.

Table 5 – Gas application without built-in transmitter, standard models

Marking	Temperature class	Ambient temperature range (T_a) at the connection side	Process temperature range at the tip of the probe or thermowell
II 1G Ex ia IIC T1 - T6 Ga II 1/2G Ex ia IIC T1 - T6 Ga/Gb II 2G Ex ia IIC T1 - T6 Gb	T6	-50 °C up to +80 °C	-50 °C … +(80 °C - P_i x Rth)
	T5	-50 °C up to +85 °C	-50 °C … +(95 °C - P_i x Rth)
	T4	-50 °C up to +85 °C	-50 °C … +(130 °C - P_i x Rth)
	T3	-50 °C up to +85 °C	-50 °C … +(195 °C - P_i x Rth)
	T2	-50 °C up to +85 °C	-50 °C … +(250 °C - P_i x Rth)
	T1	-50 °C up to +85 °C	-50 °C … +(250 °C - P_i x Rth)

15.3.2.3.2 Applications requiring EPL Da, Da/Db or Db equipment

For Equipment Group III applications (explosive dust atmospheres), the following surface temperatures and ambient temperature ranges apply.

Table 6 – Dust application without built-in transmitter, standard models

Marking	Permitted power (P_i)	Ambient temperature range (T_a) at connection side	Process temperature range at the tip of the probe or thermowell
II 1D Ex ia IIIC T_{200} x °C Da II 1/2D Ex ia IIIC Tx °C Da/Db II 2D Ex ia IIIC Tx °C Db	750 mW	-50 °C up to +40 °C	-50 °C … +(Tx °C – P_i x Rth)
	650 mW	-50 °C up to +70 °C	
	550 mW	-50 °C up to +85 °C	

Tx (°C) is the permissible surface temperature.
Tx (°C) ≤ 2/3 x ignition temperature of a dust cloud
Tx (°C) ≤ Glow temperature of a 5 mm dust layer − 75 °C

For models without built-in transmitter, power dissipation occurs only at the probe tip.
The resulting temperature rise due to sensor self-heating at the probe tip is determined by Pi × Rth.

- Thermal resistance (Rth) = 250 K/W for gas applications
- Thermal resistance (Rth) = 304 K/W for dust applications

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15.3.2.4 Standard models without built-in transmitter, variants with permanently connected cable (sensor connected directly to the electrical output)

Applicable to the following model series: TR31-K-*-TT-*, TR31-K-*-P*-*, TR31-K-*-S*-*

15.3.2.4.1 Applications requiring EPL Ga, Ga/Gb or Gb equipment

For Equipment Group II applications (explosive gas atmospheres), the following temperature classes and ambient temperature ranges apply.

Table 7 – Gas application without built-in transmitter, Model TR31-K

Marking	Temperature class	Ambient temperature range (T_a) at the connection side	Process temperature range at the tip of the probe or thermowell
II 1G Ex ia IIC T1 - T6 Ga II 1/2G Ex ia IIC T1 - T6 Ga/Gb II 2G Ex ia IIC T1 - T6 Gb	T6	-20 °C up to +80 °C	-50 °C … +(80 °C - P_i x Rth)
	T5	-20 °C up to +85 °C	-50 °C … +(95 °C - P_i x Rth)
	T4	-20 °C up to +85 °C	-50 °C … +(130 °C - P_i x Rth
	T3	-20 °C up to +85 °C	-50 °C … +(195 °C - P_i x Rth)
	T2	-20 °C up to +85 °C	-50 °C … +(250 °C - P_i x Rth)
	T1	-20 °C up to +85 °C	-50 °C … +(250 °C - P_i x Rth)

15.3.2.4.2 Applications requiring EPL Da, Da/Db or Db equipment

For Equipment Group III applications (explosive dust atmospheres), the following surface temperatures and ambient temperature ranges apply.

Table 8 – Dust application without built-in transmitter, Model TR31-K

Marking	Permitted power (P_i)	Ambient temperature range (T_a) at connection side	Process temperature range at the tip of the probe or thermowell
II 1D Ex ia IIIC T_{200} x °C Da	750 mW	-20 °C up to +40 °C	-50 °C … +(Tx °C – P_i x Rth)
II 1/2D Ex ia IIIC Tx °C Da/Db	650 mW	-20 °C up to +70 °C	
II 2D Ex ia IIIC Tx °C Db	550 mW	-20 °C up to +85 °C	

Tx (°C) is the permissible surface temperature.
Tx (°C) ≤ 2/3 x ignition temperature of a dust cloud
Tx (°C) ≤ Glow temperature of a 5 mm dust layer − 75 °C

For models without built-in transmitter, power dissipation occurs only at the probe tip.
The resulting temperature rise due to sensor self-heating at the probe tip is determined by Pi × Rth.

- Thermal resistance (Rth) = 250 K/W for gas applications
- Thermal resistance (Rth) = 304 K/W for dust applications

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16 **Report Number**

BVS PP 14.2221 EU / N1, as of 2026-06-02

17 **Specific Conditions of Use**

17.1 Special conditions for use to be listed in EU Type Examination Certificate

17.1.1 Heat input (e.g. process heat backflow or radiant heat from the environment) that causes the temperature of the connection head or enclosure to exceed the permissible ambient temperature or the temperature class shall be prevented. This shall be achieved by suitable thermal insulation, by an adequately long neck tube, or by equivalent on-site measures. The heat input shall be determined by the user by calculation or measurement. The permissible ambient temperature shall not be exceeded at any point on the enclosure surface.

17.1.2 The wall thickness is greater than 0.2 mm and less than 1 mm. The instrument shall therefore not be subjected to mechanical stresses that could adversely affect the partition wall. Alternatively, a thermowell with a suitable minimum wall thickness may be used.

17.1.3 When a thermowell or neck tube is used, the overall design shall ensure installation such that a sufficiently tight gap (minimum degree of protection IP67) or, where applicable, a flameproof joint in accordance with IEC 60079-1 is provided towards the less hazardous area.

17.1.4 For variants with an optional connection cable with a moulded M12 × 1 connector, the ambient temperature range (Ta) is limited to −20 °C to +80 °C.

17.1.5 For variants with optional M12 × 1 to DIN EN 175301-803 (Form A) adapters, the ambient temperature range (Ta) is limited to −40 °C to +85 °C.

17.2 Additional conditions

None

18 **Essential Health and Safety Requirements**

Met by compliance with the requirements mentioned in item 9.

The standard IEC 60079-11:2023 is for this equipment safety-related equivalent to the harmonized standard EN 60079-11:2012.

19 **Remarks and additional information**

Drawings and documents are listed in the confidential report.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA Testing and Certification GmbH
Bochum, 2026-06-02
BVS-FFa/BO A 20221007 / 343539500

Managing Director

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