



# EXPLOSION PROTECTION

## CERTIFICATE OF CONFORMITY

Cert NO.GYJ21.3386X

This is to certify that the product

Resistance Thermometer/Thermocouple

manufactured by WIKA Alexander Wiegand SE & Co.KG

(Address: Alexander-Wiegand-Straße 30, 63911 Klingenberg,  
Germany)

which model is TR series/TC series

Ex marking See attachment

product standard /

drawing number 14026985.01

has been inspected and certified by NEPSI, and that it conforms

to GB 3836.1-2010, GB 3836.4-2010, GB 3836.20-2010, GB 12476.1-2013,  
GB 12476.4-2010.

This Approval shall remain in force until 2026.11.21

**Remarks**

1. Conditions for safe use are specified in the attachment to this certificate.
2. Symbol "X" placed after the certification number denotes specific conditions of use, which are specified in the attachment to this certificate.
3. Model designation is specified in the attachment to this certificate.
4. Intrinsic safety parameters specified in the attachment to this certificate.
5. This certificate is also applicable for the product with the same type manufactured by WIKA Instrumentation (Suzhou) Co., Ltd. (Address: No.81, Ta Yuan Road SND Suzhou, PR China 215011)

Director

National Supervision and Inspection Centre for  
Explosion Protection and Safety of Instrumentation

Issued Date 2021.11.22

This Certificate is valid for products compatible with the documents and samples approved by NEPSI.

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# 国家级仪器仪表防爆安全监督检验站

## National Supervision and Inspection Centre for Explosion Protection and Safety of Instrumentation

( GYJ21.3386X )

(Attachment I )

### Attachment I to GYJ21.3386X

( translation )

TC/TR series Thermocouple/Resistance Thermometer, manufactured by WIKA Alexander Wiegand SE & Co.KG or WIKA Instrumentation (Suzhou) Co., Ltd., has been certified by National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation (NEPSI). The Thermocouple/Resistance Thermometer accords with following standards:

- GB3836.1-2010 Explosive atmospheres-Part 1: Equipment-General requirements
- GB3836.4-2010 Explosive atmospheres-Part 4: Equipment protection by intrinsic safety "I"
- GB3836.20-2010 Explosive atmospheres-Part 20: Equipment with equipment protection level (EPL) Ga
- GB12476.1-2013 Electrical apparatus for use in the presence of combustible dust-Part 1: General requirements
- GB12476.4-2010 Electrical apparatus for use in the presence of combustible dust-Part 4:  
Protection by intrinsic safety "ID"

The Ex marking is

- Ex ia IIC T1~T6 Ga
- Ex ia IIC T1~T6 Gb
- Ex ia IIC T1~T6 Ga/Gb
- Ex ib IIC T1~T6 Gb
- Ex ic IIC T1~T6 Gc
- Ex iaD 20 T65/T95/T125
- Ex iaD 21 T65/T95/T125
- Ex iaD 20/21 T65/T95/T125
- Ex ibD 21 T65/T95/T125,,

its certificate number is GYJ21.3386X.

General description	Name of product
Measuring inserts without connection head or enclosure	TR10-1, TR10-K, TC10-1, TC10-K
Industrial TC or RTD assembly	TC10-0,TC10-2,TC10-A,TC10-B, TC10-C, TC10-D, TC10-F, TC10-H,TC12-A, TC12-B,TC12-M,TC40, TC55,TR10-0,TR10-2,TR10-A,TR10-B, TR10-C, TR10-D, TR10-F, TR10-H, TR12-A, TR12-B, TR12-M, TR25,TR40,TR41,TR55
Miniature resistance thermometer	TR20,TR22-A,TR22-B
Bayonet TC or RTD assembly	TR53, TC53
Tube skin TC or RTD assembly	TR50,TC50,TC53, TC59-W,TC59-V
Outdoor/indoor resistance thermometer	TR60
High Temperature TC or RTD Assembly	TC81,TR81
High pressure thermocouple	TC90
Multipoint TC or RTD assembly	TC95,TR95

## 1. Special Conditions for Safe Use

The suffix "X" placed after the certificate indicates that the product is subject to special conditions for safe use specified as follows:

1.1 Types with  $\Phi \leq 3\text{mm}$  or "grounded measuring points" do not comply to clause 6.3.12 of GB3836.4-2010 because of the kind of use. By that from a safety-related view this intrinsically safe circuits shall be considered as galvanically connected to ground potential. Potential equalization shall exist in the complete course of the erection of the intrinsically safe circuits. Furthermore for the connection the requirements of clause 12.2.4 in GB/T 3836.15-2017 shall be considered.

1.2 For devices that do not comply with the electrostatic requirements of GB3836.1-2010, GB12476.1-2013 and GB3836.20-2010 due to their construction, electrostatic discharge shall be avoided.

1.3 The used transmitters/digital displays shall be provided with their own certificates in accordance to GB3836 and GB12476 series standards. The installation conditions, the electrical connection values, the temperature class and the permissible ambient temperature shall be taken from the corresponding Ex certificate and shall be considered.

1.4 A reverse heat flow from the process exceeding the permissible ambient temperature of the transmitter, the digital display or the enclosure is not allowed and shall be avoided by a suitable thermal insulation or a suitable neck length of the tubing.

1.5 In case of wall thickness less than 1mm the device may not be exposed to environmental conditions which may negatively affect the partition wall. A thermowell with a suitable minimum wall thickness can be used alternatively.

1.6 Using a thermowell/neck tube the device shall be constructed in a way that allows an installation that results in a sufficient tight joint (IP66/IP67) or a flameproof joint (GB3836.2-2010) in the direction of the less endangered area.

1.7 The circuits of the coaxial multipoint thermocouples shall be considered as connected due to their construction. For the application a separate examination shall be done resp. for the connection of the coaxial multipoint thermocouple special condition for safe use must be considered if applicable. An additionally assessment as an intrinsically safe system shall be done. (e.g. connection of several circuits of different transmitters etc.)

1.8 For the use of enclosures they shall either be provided with their own Ex certificate or they shall comply to the minimum IP requirement. At least IP20 (at least IP6X for dust) applies for all enclosures. Light metal enclosures, however, shall comply with clause 8.1.2 of GB3836.1-2010 (for gas) or clause 6.2.1 of GB12476.1-2013 (for dust). Non-metallic enclosures or powder-coated enclosures shall also comply with clause 7.4.2 of GB3836.1-2010 (for gas) or clause 6.1.5.1 of GB12476.1-2013 (for dust) have a corresponding warning marking.

1.9 Accessible parts of metallic enclosures which are not connected to ground and accessible parts of metallic enclosures which are connected to ground but do not comply with clause 6.5 of GB3836.4-2010, shall comply with clause 7.5 of IEC 60079-0: 2011 or have a corresponding warning marking.

## 2. Conditions for Safe Use

2.1 For Explosive gas atmospheres, the relationship between Ex marking, temperature class, ambient temperature range and maximum surface temperature ( $T_{max}$ ) at the tip of the probe or thermowell are as following:

Ex marking	Temperature class	Ambient temperature range ( $T_a$ ) <sup>Note1</sup>	Maximum surface temperature ( $T_{max}$ ) at the tip of the probe or thermowell
Ex ia IIC T6 Ga Ex ia IIC T6 Gb Ex ia IIC T6 Ga/Gb Ex ib IIC T6 Gb Ex ic IIC T6 Gc	T6	-40°C~+80°C -50°C~+80°C	T <sub>M</sub> (medium temperature) + self-heating Special conditions for safe use listed above shall be considered
Ex ia IIC T5 Ga Ex ia IIC T5 Gb Ex ia IIC T5 Ga/Gb Ex ib IIC T5 Gb Ex ic IIC T5 Gc	T5	-40°C~+80°C -50°C~+95°C	
Ex ia IIC T1~T4 Ga Ex ia IIC T1~T4 Gb Ex ia IIC T1~T4 Ga/Gb Ex ib IIC T1~T4 Gb Ex ic IIC T1~T4 Gc	T1~T4	-40°C~+80°C -50°C~+100°C	

Note1: Temperature range -40 °C to +80 °C for standard models. Extended temperature ranges are possible for special models. These models are manufactured with special components, i.e. suitable casting compound, enclosures and cable glands for extended temperature ranges.

- For applications that require devices of EPL Gb, devices of EPL Ga may also be used. The same electrical parameters as EPL Ga must be applied. If a device of EPL Ga is used in an application requiring EPL Gb it may not be re-used in an application requiring EPL Ga.

- For applications that require devices of EPL Gc, devices of EPL Ga or Gb may also be used. The same electrical parameters as EPL Ga or Gb must be applied. If a device of EPL Ga or Gb is used in an application requiring EPL Gc it may not be re-used in an application requiring EPL Ga or Gb.

- For the installation of a transmitter and/or a digital display the special conditions for safe use shall be considered.

2.2 For combustible dust atmospheres, the relationship between Ex marking, Power  $P_i$ , ambient temperature range and maximum surface temperature ( $T_{max}$ ) at the tip of the probe or thermowell are as following:

Ex marking	Power $P_i$	Ambient temperature range ( $T_a$ ) <sup>Note2</sup>	Maximum surface temperature ( $T_{max}$ ) at the tip of the probe or thermowell
Ex iaD 20 T65 Ex iaD 21 T65 Ex iaD 20/21 T65 Ex ibD 21 T65	750mW	40°C~+40°C 50°C~+40°C	T <sub>M</sub> (medium temperature) + self-heating Special conditions for safe use listed above shall be considered
Ex iaD 20 T95 Ex iaD 21 T95 Ex iaD 20/21 T95 Ex ibD 21 T95	650mW	40°C~+70°C 50°C~+70°C	
Ex iaD 20 T125 Ex iaD 21 T125 Ex iaD 20/21 T125 Ex ibD 21 T125,	550mW	40°C~+80°C 50°C~+100°C	

Note2: Temperature range -40 °C to +80 °C for standard models. Extended temperature ranges are possible for special models. These models are manufactured with special components, i.e. suitable casting compound, enclosures and cable glands for extended temperature ranges.

- For applications that Zone 21, devices of Ex marking 20 may also be used. The same electrical parameters as Zone 20 must be applied. If a device of Ex marking 20 is used in an application requiring Zone 21 it may not be re-used in an application requiring Zone 20.

- For the installation of a transmitter and/or a digital display the special conditions for safe use shall be considered.

2.3 The intrinsic safety parameters are as following:

- Explosive atmospheres :

$U_i$ (V)	$I_i$ (mA)	$P_i$ (W) <sup>Note3</sup>	$C_i$	$L_i$
30	550	1.5	≈0nF <sup>Note4</sup>	≈0mH <sup>Note4</sup>

- Combustible dust :

$U_i$ (V)	$I_i$ (mA)	$P_i$ (W) <sup>Note5</sup>	$C_i$	$L_i$
30	550	Values from table of 2.2	≈0nF <sup>Note4</sup>	≈0mH <sup>Note4</sup>

Note3: The permissible power for the sensor depends on the medium temperature  $T_M$ , the temperature class and the thermal resistance  $R_{th}$ , but not more than 1.5 W.

Note4: The values for cable probes shall be taken from the type label and shall be considered for the connection to an intrinsically safe power supply.

Note5: The permissible power for the sensor depends on the medium temperature  $T_M$ , the temperature class and the thermal resistance  $R_{th}$ , but not more than the values from table of 2,2 , column 2.

2.4 The output intrinsic safety parameters of the Thermocouple/Resistance Thermometer to the sensor circuit are as following:

- Explosive atmospheres :

U <sub>i</sub> (V)	I <sub>i</sub> (mA)	P <sub>i</sub> (W) <sup>Note2</sup>
30	550	1.5

- Combustible dust :

U <sub>i</sub> (V)	I <sub>i</sub> (mA)	P <sub>i</sub> (W) <sup>Note4</sup>
30	550	Values from table of 2.2

2.5 For the use of multiple sensors and simultaneous operation the summation of all single power dissipation may not exceed the maximum permissible power dissipation. The maximum permissible power shall be limited to 1.5 W, resp. The values from table of 2.2 ,column 2 shall be considered by the end-user in the end-use application.

2.6 When built-in transmitter or digital display is used, the output intrinsic safety parameters shall be the same as specified in clause 2.3. The input intrinsic safety parameters shall be taken from the corresponding Ex certificate issued by certificate body according to GB3836 and GB12476 series standards.

2.7 For the isolated single element the above specified values are valid. For elements which are considered as grounded due to their construction the specified values apply for the sensors in sum.

2.8 The circuits of the coaxial element shall be considered as connected due to their construction. For the application a separate examination shall be done resp. for the connection of the coaxial multi-point thermocouple special conditions for safe use shall be considered if applicable. An additionally assessment as an intrinsically safe system shall be done (e.g. connection of several circuits of different transmitters etc.).

2.9 The thermal resistance are as following: ( $R_{th}$  in K/W)

Diameter of the sensor	2.0mm- <3.0mm	3.0mm- <6.0mm	6.0mm- 8mm	3.0mm- 6.0mm <sup>Note6</sup>	0.5mm- <1.5mm	1.5mm- <3.0mm	3.0mm- <6.0mm	6.0mm- 12.0mm
Sensor	RTD	RTD	RTD	RTD	TC	TC	TC	TC
Without thermowell	245	110	75	225	105	60	20	5
With thermowell - Fabricated (straigh and tapered) (e.g. TW22, TW35, TW40, TW45 etc..)	135	60	37	/	/	/	11	2.5
With thermowell – bar stock (straight and tapered) (e. g. TW10, TW15, TW20, TW25, TW30, TW50, TW55, TW60 etc.)	50	22	16	/	/	/	4	1
Special designed thermowell - EN 14597	/	/	33	/	/	/	/	2.5
Tx55 (support tube)	/	110	75	225	/	/	20	5
Fitted in a blind hole (minimum wall thickness 5 mm)	50	22	16	45	22	13	4	1

Note6: Surface sensitivity

2.10 Forbid end user to change the configuration to ensure the equipment's explosion protection performance.

2.11 For installation, use and maintenance of the product, the end user shall observe the instruction manual and the following standards:

GB3836.13-2013 "Explosive atmospheres- Part 13:Equipment repair, overhaul and reclamation".

GB/T3836.15-2017 "Explosive atmospheres- Part 15:Electrical installations design, selection and erection".

GB/T3836.16-2017 "Explosive atmospheres- Part 16:Electrical installations inspection and maintenance".

GB/T3836.18-2017 "Explosive atmospheres-Part 18: Intrinsically safe electrical systems".

GB50257-2014 "Code for construction and acceptance of electric equipment on fire and explosion hazard electrical equipment installation engineering".

GB15577-2018 "Safety regulations for dust explosion prevention and protection".

### 3. Manufacturer's Responsibility

3.1 Special condition for safe use specified above should be included in the instruction manual.

3.2 Manufacturing should be done according to the documentation approved by NEPSI.

**National Supervision and Inspection Center  
for Explosion Protection and Safety of Instrumentation**

November 22<sup>th</sup>, 2021