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防爆合格证

证 号: GYJ25.1012X

制 造 商 恩德斯+豪斯公司

(地址: Obere Wank 1, 87484 Nesselwang, Germany)

产 品 名 称 温度计

型 号 规 格 TM611 系列

防 爆 标 志 Ex db IIC T6...T1 Gb, Ex tb IIIC T85 °C...T450 °C Db, Ex ia IIC T6...T1 Ga, Ex ia IIIC T200 85 °C...T200 450 °C Da, Ex ia IIC T6...T1 Gb, Ex ia IIIC T85 °C...T450 °C Db

产 品 标 准 /

图 样 编 号 10000014209

经图样及技术文件的审查和样品检验, 确认上述产品符合下列标准:
GB/T 3836.1-2021, GB/T 3836.2-2021, GB/T 3836.4-2021, GB/T 3836.31-2021
特颁发此证。

本证书有效期: 2025 年 02 月 18 日 至 2030 年 02 月 17 日

备注

1. 安全使用注意事项见本证书附件。
2. 证书编号后缀“X”表明产品具有安全使用特殊条件, 内容见本证书附件。
3. 型号规格说明见本证书附件。
4. 电气安全参数见本证书附件。
5. 本证书同时适用于 Endress+Hauser Sicestherm S. r. L. (地址: Via Martin Luther King 7, 20060 Pessano con Bornago (MI), Italy) 和恩德斯豪斯温度仪表(苏州)有限公司(地址: 苏州 工业园区江田里路 31 号)生产的同型号产品。

批 准

上海仪器仪表自控系统检验测试所有限公司
国家级仪器仪表防爆安全监督检验站

颁 发 日 期 二 〇 二 五 年 二 月 十 八 日

本证书仅对与认可文件和样品一致的产品有效。

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EXPLOSION PROTECTION

CERTIFICATE OF CONFORMITY

Cert No. GYJ25.1012X

Manufacturer	Endress + Hauser Wetzer GmbH + Co. KG (Address: Obere Wank 1, 87484 Nesselwang, Germany)
Product	Temperature assemblies
Model	TM611 Series
Ex marking	Ex db IIC T6...T1 Gb, Ex tb IIIC T85 °C...T450 °C Db, Ex ia IIC T6...T1 Ga, Ex ia IIIC T₂₀₀ 85 °C...T₂₀₀ 450 °C Da, Ex ia IIC T6...T1 Gb, Ex ia IIIC T85 °C...T450 °C Db
Product standard	/
Drawing number	10000014209

The product was found to comply with the following standard(s):

GB/T 3836.1-2021, GB/T 3836.2-2021, GB/T 3836.4-2021, GB/T 3836.31-2021

Valid until: 2030.02.17

Remarks

1. Conditions for safe use are specified in the attachment(s) to this certificate.
2. Symbol "X" placed after the certification number denotes specific conditions of use, which are specified in the attachment(s) to this certificate.
3. Model designation is specified in the attachment(s) to this certificate.
4. Safe parameters specified in the attachment(s) to this certificate.
5. This certificate is also applicable for the product with the same type manufactured by Endress+Hauser Sicestherm S.r.L. (address: Via Martin Luther King 7, 20060 Pessano con Bornago (MI), Italy) and Endress+Hauser Wetzer (Suzhou) Co., Ltd. (address: No.31 JiangTianLiLu, Suzhou Industrial Park).

Approval

Shanghai Inspection and Testing Institute of
Instruments and Automation Systems Co., Ltd.
National Supervision and Inspection Center for
Explosion Protection and Safety of Instrumentation
Date of issue 2025.02.18

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

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(GYJ25.1012X)

(Attachment I)

GYJ25.1012X 防爆合格证附件 I

由恩德斯+豪斯公司生产的TM611系列温度计，经检验符合下列标准：

GB/T 3836.1-2021 爆炸性环境 第1部分：设备 通用要求

GB/T 3836.2-2021 爆炸性环境 第2部分：由隔爆外壳“d”保护的设备

GB/T 3836.4-2021 爆炸性环境 第4部分：由本质安全型“i”保护的设备

GB/T 3836.31-2021 爆炸性环境 第31部分：由防粉尘点燃外壳“t”保护的设备

产品防爆标志为 Ex ia IIC T6...T1 Ga, Ex ia IIIC T₂₀₀85 °C...T₂₀₀450 °C Da, Ex ia IIC T6...T1 Gb, Ex ia IIIC T85 °C...T450 °C Db, Ex db IIC T6...T1 Gb Ex tb IIIC T85 °C...T450 °C Db, 防爆合格证号为 GYJ25.1012X。

本证书认可的产品型号规格如下：

TM611-**a b c d e f g h i j k l m n o p q r s t u**

a 代表防爆认证代码，可为：

NA = Ex ia IIC T6...T1 Ga²⁾, Ex ia IIIC T₂₀₀85 °C...T₂₀₀450 °C Da²⁾, Ex ia IIC T6...T1 Gb, Ex ia IIIC T85 °C...T450 °C Db,

ND = Ex db IIC T6...T1 Gb Ex tb IIIC T85 °C...T450 °C Db,

NF = Ex tb IIIC T85 °C...T450 °C Db ;

b 代表温度计类型，可为：

A=工业型温度计，

B=线缆式温度计，RTD，

C=线缆式温度计，TC；

c 代表颈长，可为：

A =43mm 1.7",

B =55mm 2.2",

C =93mm 3.7",

D =105mm 4.1",

E =143mm 5.6",

F =155mm 6.1",

X =...mm, 100...500mm;

e 表示传感器类型，测量范围，材质，可为：

A = 1xPt100 TF, -50...+400 °C, 316L,

B = 1xPt100 WW, -200...+600 °C, 316L,

C = 2xPt100 WW, -200...+600 °C, 316L,

L = 1xTC type J, max. 800 °C, 316L,

M = 2xTC type J, max. 800 °C, 316L,

N = 1xTC type K, max. 1100 °C, Alloy600,

O = 2xTC type K, max. 1100 °C, Alloy600;

g 代表电气连接，可为：

0A = 引出线，

1A = 陶瓷接线端，

2C = 4-20mA, 1-通道 TMT71, 模块变送器 DIN B ,

2H = 4-20 mA, 1-通道 TMT31, PCP 0.15 K, 模块变送器 DIN B ,

2I = 4-20 mA, 1-通道 TMT31, PCP 0.1 K, 模块变送器 DIN B ,

3A = HART, 1-通道 TMT72, 模块变送器 DIN B ,

3F = 4-20mA HART, 2-通道 TMT82 SIL OIML/MID 气体, 模块变送器 DIN B ,

3I = 4-20mA HART, 2-通道 TMT82 SIL OIML/MID for 液体, 模块变送器 DIN B ,

4A = FOUNDATION Fieldbus, 2-通道 TMT85, 模块变送器 DIN B ,

5A = PROFIBUS PA, 2-通道 TMT84, 模块变送器 DIN B ,

6B = PROFINET w. Ethernet-APL/SPE, TMT86, 模块变送器 DIN B ,

6C = PROFINET w. Ethernet-APL/SPE, TMT86 SIL, conformity + PROFIsafe, 模块变送器
DIN B;

h 代表外壳型号/材质/IP 等级，可为：

A0¹⁾ = 线缆式温度计无外壳，

A1¹⁾³⁾ = TA30A 翻盖; 铝; IP66/68,

A3¹⁾ = TA20AB 紧凑型, 旋盖; 铝; IP66,

D1¹⁾³⁾ = TA30D 高翻盖; 铝; IP66/68,

E2¹⁾ = TA30EB 旋盖; 铝; IP66/68,

E3¹⁾ = TA30EB 带显示, 旋盖; 铝; IP66/68,

H1 = TA30H Ex d/XP; 316L; IP66/68,

H2 = TA30H Ex d/XP 带显示; 316L; IP66/68,

H3 = TA30H Ex d/XP; 铝; IP66/68,

H4 = TA30H Ex d/XP 带显示; 铝; IP66/68,

H5=TA30H 现场外壳, 正面显示; 铝; IP66/68,

H6=TA30H 现场外壳, 正面显示; 316; IP66/68,

P1¹⁾=TA30P 紧凑型, 高翻盖; PA 黑色; IP65; BASF 标准,

R1¹⁾=TA30R 紧凑型, 旋盖; 316L ; IP68,

R2¹⁾=TA30R 紧凑型 带显示; 316L ; IP68,

R3¹⁾=TA30R 紧凑型, 高悬盖; 316L ; IP68,

R4¹⁾=TA30R 紧凑型 带显示; 316L 抛光; IP68,

R5¹⁾=TA30R 紧凑型, 旋盖; 316L 抛光; IP68,

R6¹⁾ TA30R 紧凑型, 高旋盖 316L 抛光; IP68;

i 代表接线盒的线缆引入接口, 可为:

0¹⁾=无外壳,

A =1x M20 x1.5,

B =1x NPT 1/2,

C¹⁾³⁾=1x G1/2,

D =2x M20 x1.5,

E =2x NPT1/2;

j 代表延长线, 外皮, 可为:

A =无,

C²⁾=4 线, 最高+200°C; PTFE+PTFE,

D²⁾=2x3 线 最高+180°C; PTFE+Silicone,

G²⁾=TC 延长线; 剥离纤维,

H²⁾=TC 延长线; PVC 蓝;

k 代表延长线长度, 可为:

A =无,

X =... mm, 500...10.000mm;

m 代表第二变送器, 可为:

GC¹⁾=4-20mA, 1-通道 TMT71, 模块变送器 DIN B,

GD¹⁾=4-20mA HART, 1-通道 TMT72, 模块变送器 DIN B,

GE¹⁾=4-20mA HART, 2-通道 TMT82, 模块变送器 DIN B,

GF¹⁾=4-20mA HART, 2-通道 TMT82 SIL, 模块变送器 DIN B,

GG¹⁾=PROFIBUS PA, 2-通道 TMT84, 模块变送器 DIN B,

GH¹⁾=FOUNDATION Fieldbus, 2-通道 TMT85, 模块变送器 DIN B,

GK¹⁾=PROFINET over Ethernet-APL/SPE, TMT86, 10Mbit/s, 模块变送器 DIN B,

GL¹⁾=PROFINET over Ethernet-APL/SPE, TMT86, SIL conformity + PROFIsafe, 10Mbit/s,
模块变送器 DIN B。

其余代表尺寸直径，材质，类型，传感器标准，分类，设备型号，服务，测试，证书，
声明，额外认证，额外附件，标定，固件版本等，与防爆性能无关。

¹⁾仅当 a =NA 时

²⁾仅当 b =B,C 时

³⁾仅当 a =NF 时

一、产品安全使用特殊条件

产品防爆合格证号后缀“X”表示产品有安全使用特殊要求，具体内容如下：

1、涉及隔爆接合面的维修须联系产品制造商。

2、产品使用环境温度、介质温度范围与产品型号、温度组别的关系如下：

a =ND,NF，装配 RTD 传感器时

产品型号	电气连接 ¹⁾	温度组别/ 最高表面温度	使用环境温度	介质温度范围
				传感器直径 3mm
TM611	陶瓷接线端 g = 1A	T6/T85°C	-50°C~+70°C	-50°C~+55°C
		T5/T100°C	-50°C~+80°C	-50°C~+70°C
		T4/T135°C	-50°C~+120°C	-50°C~+105°C
		T3/T200°C	-50°C~+120°C	-50°C~+170°C
		T2/T300°C	-50°C~+120°C	-50°C~+265°C
		T1/T450°C	-50°C~+120°C	-50°C~+415°C
	引出线= 0A 或 变送器 TMT31 = 2H, 2I TMT71 = 2C TMT72 = 3A TMT82=3C, 3D, 3F, 3I TMT84 = 5A TMT85 = 4A TMT86 = 6B, 6C	T6/T85°C	-40°C~+65°C	-50°C~+55°C
		T5/T100°C	-40°C~+80°C	-50°C~+70°C
		T4/T135°C	-40°C~+85°C	-50°C~+105°C
		T3/T200°C	-40°C~+85°C	-50°C~+170°C
		T2/T300°C	-40°C~+85°C	-50°C~+265°C
		T1/T450°C	-40°C~+85°C	-50°C~+415°C

装配 TC 传感器时

产品型号	电气连接 ¹⁾	温度组别/最高表面温度	使用环境温度	介质温度范围
TM611	陶瓷接线端 $I_g = 1A$	T6/T85°C	-50°C~+70°C	-50°C~+85°C
		T5/T100°C	-50°C~+80°C	-50°C~+100°C
		T4/T135°C	-50°C~+120°C	-50°C~+135°C
		T3/T200°C	-50°C~+120°C	-50°C~+200°C
		T2/T300°C	-50°C~+120°C	-50°C~+300°C
		T1/T450°C	-50°C~+120°C	-50°C~+450°C
	引出线= 0A or 变送器 TMT71 = 2C TMT72 = 3A TMT82=3C, 3D, 3F, 3I TMT84 = 5A TMT85 = 4A TMT86 = 6B, 6C	T6/T85°C	-40°C~+65°C	-50°C~+85°C
		T5/T100°C	-40°C~+80°C	-50°C~+100°C
		T4/T135°C	-40°C~+85°C	-50°C~+135°C
		T3/T200°C	-40°C~+85°C	-50°C~+170°C
		T2/T300°C	-40°C~+85°C	-50°C~+265°C
		T1/T450°C	-40°C~+85°C	-50°C~+415°C

¹⁾ $I_h = A1, D1, H1$ 或 $H3$.

TM611 的组件 TT611 工作温度范围和材料的关系:

材料	工作温度范围
AlSi 1MgMn	-50°C ~ +150°C
1.4404, 1.4529, 2.4816, 2.4819	-50°C ~ +450°C
1.4547	-20 °C ~ +400 °C
1.4539	-50 °C ~ +425 °C
1.4462	-30 °C ~ +300 °C
1.4410	-35 °C ~ +260 °C

$a=NA$ 时,传感器的最高介质温度和传感器直径、最大输入功率以及温度组别的关系:

传感器直径	温度组别/最高表面温度	$P_i \leq 50mW$	$P_i \leq 100mW$	$P_i \leq 200mW$	$P_i \leq 500mW$
		最高介质温度			
3mm, 3mm 双支	T1/450°C	426	415	396	343
	T2/300°C	276	265	246	193
	T3/200°C	181	170	151	98
	T4/135°C	116	105	86	33
	T5/95°C	81	70	51	-2
	T6/85°C	66	55	36	-17
传感器直径	温度组别/最高表面温度	$P_i \leq 650mW$	$P_i \leq 750mW$	$P_i \leq 800mW$	$P_i \leq 1000mW$
		最高介质温度			
3mm, 3mm 双支	T1/450°C	333	320	312	280
	T2/300°C	183	170	162	130
	T3/200°C	88	75	62	30
	T4/135°C	23	10	2	-30
	T5/95°C	-12	-25	-33	/
	T6/85°C	-27	-40	/	/

注: (1)接线盒处的环境温度应限制在-40°C~+130°C,当选配 TA30A, TA30D, TA30D 和 TA30H 接线盒时为-50°C~130°C。当防爆标志 Ex ia IIC Gb 时最低使用环境温度可为-60°C。选配其他可选配件时参考配件的使用环境温度。

(2)装配 2 个模块变送器的温度计,最高使用环境温度比装配单个模块变送器的温度计低 12K。

(3)热电偶的最高使用环境温度等于最高介质温度。

3、当 $a = ND$, 温度计为引出线结构 ($g = 0A$) 应选用直径不超过 45mm, 最大输入功率不超过 2.2W 的模块变送器, 和供电不超过 10VDC, 1mA 的传感器。

4、当产品安装于要求 EPL Ga 级的场所时, 用户须采取有效措施防止产品外壳由于冲击或摩擦引起的点燃危险。

5、当产品安装于要求 EPL Ga 级的场所且 $b = B, C$ 时, 应避免线缆上产生静电。

二、产品使用注意事项

1、电气参数:

当 $a=ND$ 时, 电源输入:

变送器:42 VDC, 23 mA

传感器:10VDC, 1mA

当 $a = NA$ 时, 本安输入参数:

电气连接 ¹⁾	Ui	Ii	Pi	Ci	Li
TMT71 2C	30V	100 mA	800 mW	0	0
TMT72 3A	30V	100 mA	800 mW	0	0
TMT82 3C, 3D, 3F, 3I	30 V	130 mA	800 mW	0	0
TMT84: 5A	FISCO field device				
TMT85: 4A	FISCO field device				
TMT86: 6B, 6C	FISCO field device				
陶瓷接线端: 1A	30 V	140 mA	1000 mW	见下表	
引出线: 0A ²⁾	30 V	140 mA	1000 mW	见下表	

¹⁾:代码 g

²⁾:适用于 $b = B, C$

$g = 0A, 1A$ 时, Ci 和 Li 的计算公式:

传感器类型	Neck Length E		Flying leads		Terminal block	
	Ci [F/m]	Li [H/m]	Ci [F/m]	Li [H]	Ci [F/m]	Li [H]
单支	2,00E-10	1,00E-06	1,96E-11	9,80E-08	4,60E-12	2,30E-08
双支	4,00E-10	2,00E-06	3,92E-11	1,96E-07	9,20E-12	4,60E-08

$$Ci = Ci_{\text{Neck Length E}} \times E + Ci_{\text{Flying leads}}$$

$$Li = Li_{\text{Neck Length E}} \times E + Li_{\text{Flying leads}}$$

$$Ci = Ci_{\text{Neck Length E}} \times E + Ci_{\text{Terminal block}}$$

$$Li = Li_{\text{Neck Length E}} \times E + Li_{\text{Terminal block}}$$

$b = B, C$ 时, Ci 和 Li 的计算公式::

传感器类型	Neck Length E		Cable Connection		Length Extension Wires L	
	Ci [F/m]	Li [H/m]	Ci [F/m]	Li [H]	Ci [F/m]	Li [H]
单支	2,00E-10	1,00E-06	2,50E-11	1,25E-08	2,00E-10	1,00E-06
双支	4,00E-10	2,00E-06	5,00E-11	2,50E-07	4,00E-10	2,00E-06

$$Ci = Ci_{\text{Neck Length E}} \times E + Ci_{\text{Cable connection}} + Ci_{\text{Length Extension Wires L}} \times L$$

$$Li = Li_{\text{Neck Length E}} \times E + Li_{\text{Cable connection}} + Li_{\text{Length Extension Wires L}} \times L$$

2、用户不得自行随意更换该产品的电气零部件, 应会同产品制造商共同解决运

行中出现的故障，以免影响防爆性能和损坏现象的发生。

3、产品的安装、使用和维护应同时遵守产品使用说明书、GB/T 3836.13-2021“爆炸性环境 第13部分：设备的修理、检修、修复和改造”、GB/T 3836.15-2017“爆炸性环境 第15部分：电气装置的设计、选型和安装”、GB/T 3836.16-2022“爆炸性环境 第16部分：电气装置的检查与维护”、GB/T 3836.18-2024“爆炸性环境 第18部分：本质安全电气系统”、GB 50257-2014“电气设备安装工程爆炸和火灾危险环境电气装置施工及验收规范”及GB 15577-2018 粉尘防爆安全规程的有关规定。

三、制造厂责任

1、产品制造厂必须将上述产品安全使用特殊条件和使用注意事项纳入该产品使用说明书。

2、制造厂必须严格按照NEPSI认可的文件资料生产。

上海仪器仪表自控系统检验测试所有限公司
国家级仪器仪表防爆安全监督检验站
二〇二五年二月十八日



(GYJ25.1012X)

(Attachment I)

Attachment I to GYJ25.1012X

1. Description

Thermometer typed TM611 manufactured by Endress + Hauser Wetzler GmbH + Co. KG, has been certified by National Supervision and Inspection Center for Explosion Protection and Safety of Instrumentation (NEPSI). This product accords with following standards:

GB/T 3836.1-2021 Explosive atmospheres-Part 1: Equipment-General requirements

GB/T 3836.2-2021 Explosive atmospheres-Part 2: Equipment protection by flameproof enclosure "d"

GB/T 3836.4-2021 Explosive atmospheres-Part 4: Equipment protection by intrinsic safety "i"

GB/T 3836.31-2021 Explosive atmospheres-Part 31: Equipment dust ignition protection by enclosure "t"

The Ex marking is shown in the type code designation, its certificate number is GYJ25.1012X.

Type approved in this certificate is shown as below:

TM611-**a b c d e f g h i j k l m n o p q r s t u**

a indicates approval code, including

NA = Ex ia IIC T6...T1 Ga², Ex ia IIIC T₂₀₀85 °C...T₂₀₀450 °C Da²,

Ex ia IIC T6...T1 Gb, Ex ia IIIC T85 °C...T450 °C Db,

ND = Ex db IIC T6...T1 Gb Ex tb IIIC T85 °C...T450 °C Db,

NF = Ex tb IIIC T85 °C...T450 °C Db ;

b indicates Thermometer Design, including

A =Industrial thermometer ,

B¹=Cable thermometer RTD, G1/2 connection ,

C¹=Cable thermometer TC, G1/2 connection ;

d indicates Neck length E, including

A =43mm 1.7" ,

B =55mm 2.2" ,

C =93mm 3.7" ,

D =105mm 4.1" ,

E =143mm 5.6" ,

F =155mm 6.1" ,

X =...mm,100...500mm ;

e indicates Sensor Type; Measuring Range; Material including

A =1xPt100 TF; -50...+400 °C; 316L ,

B =1xPt100 WW; -200...+600 °C; 316L ,

C =2xPt100 WW; -200...+600 °C; 316L ,

L =1xTC type J; max. 800 °C; 316L ,

M =2xTC type J; max. 800 °C; 316L ,

N =1xTC type K; max. 1100 °C; Alloy600 ,

O =2xTC type K; max. 1100 °C; Alloy600 ;

g indicates Electrical Connection

0A =Flying leads ,

1A =Terminal block ,

2C =4-20mA, 1-channel TMT71, head transmitter DIN B ,

2H =4-20 mA, 1-channel TMT31, PCP 0.15 K, head transmitter DIN B ,

2I =4-20 mA, 1-channel TMT31, PCP 0.1 K, head transmitter DIN B ,

3A =HART, 1-channel TMT72, head transmitter DIN B ,

3F =4-20mA HART, 2-channel TMT82 SIL OIML/MID for gas, head transmitter DIN B ,

3I =4-20mA HART, 2-channel TMT82 SIL OIML/MID for liquids, head transmitter DIN B ,

4A =FOUNDATION Fieldbus, 2-channel TMT85, head transmitter DIN B ,

5A =PROFIBUS PA, 2-channel TMT84, head transmitter DIN B ,

6B =PROFINET w. Ethernet-APL/SPE, TMT86, head transmitter DIN B ,

6C =PROFINET w. Ethernet-APL/SPE, TMT86 SIL, conformity + PROFIsafe, head transmitter DIN B ;

h indicates Terminal Head, Material, Protect. Class

A0^{*1} =Cable Thermometer without housing,

A1^{*1,3} =TA30A comfort flip cover; Alu; IP66/68,

A3^{*1} =TA20AB small, cover screwed; Alu; IP66,

D1^{*1,3} =TA30D comfort, high flip cover; Alu; IP66/68,

E2^{*1} =TA30EB comfort, screwed cover; Alu; IP66/68,

E3^{*1} =TA30EB+display, comfort screwed cover; Alu; IP66/68,

H1 =TA30H Ex d/XP; 316L; IP66/68,

H2 =TA30H Ex d/XP + display; 316L; IP66/68,

H3 =TA30H Ex d/XP; Alu; IP66/68,

H4 =TA30H Ex d/XP + display; Alu; IP66/68,

H5 =TA30H field housing, display frontal; Alu; IP66/68,

H6 =TA30H field housing, display frontal; 316; IP66/68,

P1^{*1} =TA30P small, high flip cover; PA black; IP65; BASF Standard,

R1^{*1} =TA30R small, screwed cover; 316L blasted; IP68,

R2^{*1} =TA30R small + display; 316L blasted; IP68,

R3^{*1} =TA30R small, screwed high cover; 316L blasted; IP68,

R4^{*1} =TA30R small + display; 316L polished; IP68,

R5^{*1} =TA30R small, screwed cover; 316L polished; IP68,

R6^{*1} TA30R small, screwed high cover; 316L polished; IP68;

i indicates Cable entry Terminal head

0^{*1} =Without housing,

A =1x thread M20x1.5,

B =1x thread NPT1/2,

C^{*1,3} =1x thread G1/2,

D =2x thread M20x1.5,

E =2x thread NPT1/2;

j indicates Wire; Sheath

A =Not needed,

C² =4-wire, max. +200°C; PTFE+PTFE,

D² =2x3-wire, max. +180°C; PTFE+Silicone,

G² =TC extension cable; Glass fibre,

H² =TC extension cable; PVC blue;

k indicates Length Extension Wires Cable Probe

A =Not needed,

X =... mm, extension cable 500...10.000mm;

m indicates Second Transmitter =Mounted

GC^{*1} =4-20mA, 1-channel TMT71, head transmitter DIN B,

GD^{*1} =4-20mA HART, 1-channel TMT72, head transmitter DIN B,

GE^{*1} =4-20mA HART, 2-channel TMT82, head transmitter DIN B,

GF^{*1} =4-20mA HART, 2-channel TMT82 SIL, head transmitter DIN B,

GG^{*1} =PROFIBUS PA, 2-channel TMT84, head transmitter DIN B,

GH^{*1} =FOUNDATION Fieldbus, 2-channel TMT85, head transmitter DIN B,

GK^{*1} =PROFINET over Ethernet-APL/SPE, TMT86, 10Mbit/s, head transmitter DIN B,

GL^{*1} =PROFINET over Ethernet-APL/SPE, TMT86, SIL conformity + PROFIsafe, 10Mbit/s, head transmitter DIN B.

others indicates Pipe outer diameter ,Material, Form, Sensor Standard, Classification ,Device Model, Service, Test, Certificate, Declaration, Additional Approval, Additional option, Accessory mounted, Calibration Thermometer, Calibration Points≥0°C, Calibration Points ≤0°C and Firmware Version, not relevant for explosion safety.

^{*1} only possible when suffix code **a** =NA,

^{*2} only possible when suffix code **b** = B,C

^{*3}: only possible when suffix code **a** = NF

2. Special Conditions for Safe Use

The suffix "X" placed after the certificate number indicates that this product is subject to special conditions for safe use, which is:

2.1 For information on the dimensions of the flameproof joints contact the manufacturer.

2.2 The relationship between ambient temperature and temperature class is shown as follows:

The relation between the type, electrical connection, temperature class, maximum surface temperature, ambient temperature range and process temperature range is shown in the following tables.

For suffix **a** = ND, NF

Temperature assemblies with RTD temperature sensors

Type	Electrical connection*	T class/Max. surface temperature	Ambient temperature range	Process temperature range
				Insert diameter 3 mm
TM611	Terminal block g = 1A	T6/T85°C	-50°C ~ +70°C	-50°C ~ +55°C
		T5/T100°C	-50°C ~ +80°C	-50°C ~ +70°C

	Flying leads = 0A or Transmitter TMT31 = 2H, 2I TMT71 = 2C TMT72 = 3A TMT82 = 3C, 3D, 3F, 3I TMT84 = 5A TMT85 = 4A TMT86 = 6B, 6C	T4/T135°C	-50°C ~ +120°C	-50°C ~ +105°C
		T3/T200°C	-50°C ~ +120°C	-50°C ~ +170°C
		T2/T300°C	-50°C ~ +120°C	-50°C ~ +265°C
		T1/T450°C	-50°C ~ +120°C	-50°C ~ +415°C
		T6/T85°C	-40°C ~ +65°C	-50°C ~ +55°C
		T5/T100°C	-40°C ~ +80°C	-50°C ~ +70°C
		T4/T135°C	-40°C ~ +85°C	-50°C ~ +105°C
		T3/T200°C	-40°C ~ +85°C	-50°C ~ +170°C
		T2/T300°C	-40°C ~ +85°C	-50°C ~ +265°C
		T1/T450°C	-40°C ~ +85°C	-50°C ~ +415°C

Temperature assemblies with thermocouple temperature sensors

Type	Electrical connection*	T class/Max. surface temperature	Ambient temperature range	Process temperature range
TM611	Terminal block g = 1A	T6/T85°C	-50°C ~ +70°C	-50°C ~ +85°C
		T5/T100°C	-50°C ~ +80°C	-50°C ~ +100°C
		T4/T135°C	-50°C ~ +120°C	-50°C ~ +135°C
		T3/T200°C	-50°C ~ +120°C	-50°C ~ +200°C
		T2/T300°C	-50°C ~ +120°C	-50°C ~ +300°C
		T1/T450°C	-50°C ~ +120°C	-50°C ~ +450°C
	Flying leads = 0A or Transmitter TMT71 = 2C TMT72 = 3A TMT82 = 3C, 3D, 3F, 3I TMT84 = 5A TMT85 = 4A TMT86 = 6B, 6C	T6/T85°C	-40°C ~ +65°C	-50°C ~ +85°C
		T5/T100°C	-40°C ~ +80°C	-50°C ~ +100°C
		T4/T135°C	-40°C ~ +85°C	-50°C ~ +135°C
		T3/T200°C	-40°C ~ +85°C	-50°C ~ +170°C
		T2/T300°C	-40°C ~ +85°C	-50°C ~ +265°C
		T1/T450°C	-40°C ~ +85°C	-50°C ~ +415°C

* In an enclosure with a blind cover: suffix code **h** = A1, D1, H1 or H3.

Coupling element, type TT611 for TM611

material	Service temperature range
AlSi 1MgMn	-50°C to +150°C
1.4404, 1.4529, 2.4816, 2.4819	-50°C to +450°C
1.4547	-20 °C to +400 °C
1.4539	-50 °C to +425 °C

1.4462	-30 °C to +300 °C
1.4410	-35 °C to +260 °C

For suffix **a** =NA, For each dual or single element, the temperature class T6...T1 and the maximum surface temperature $T_{200} 85^{\circ}\text{C} \dots T_{200} 450^{\circ}\text{C}$ is depending on the process temperature and the Supply/output circuit power P_i , in accordance with the following tables:

Insert diameter	Temperature class/max temperature T	$P_i \leq 50\text{mW}$	$P_i \leq 100\text{mW}$	$P_i \leq 200\text{mW}$	$P_i \leq 500\text{mW}$
		Max. allowed process temperature = °C			
3mm, 3mm=dual	T1/450°C	426	415	396	343
	T2/300°C	276	265	246	193
	T3/200°C	181	170	151	98
	T4/135°C	116	105	86	33
	T5/95°C	81	70	51	-2
	T6/85°C	66	55	36	-17
Insert diameter	Temperature class/max temperature T	$P_i \leq 650\text{mW}$	$P_i \leq 750\text{mW}$	$P_i \leq 800\text{mW}$	$P_i \leq 1000\text{mW}$
		Max. allowed process temperature = °C			
3mm, 3mm=dual	T1/450°C	333	320	312	280
	T2/300°C	183	170	162	130
	T3/200°C	88	75	62	30
	T4/135°C	23	10	2	-30
	T5/95°C	-12	-25	-33	/
	T6/85°C	-27	-40	/	/

1) The ambient temperature at the mounting head may be directly influenced by the process temperature but is restricted to the range $-40^{\circ}\text{C} \dots +130^{\circ}\text{C}$ or $-50^{\circ}\text{C} \dots +130^{\circ}\text{C}$ for types TA30A, TA30D and TA30H or by the specifications of the applied integral temperature transmitter and the optional display, if appropriate. The lower temperature of -60°C is possible with marking Ex ia IIC Gb only.

2) For thermometers with two mounted head transmitters the allowed ambient temperature is 12K lower than each head transmitter's certified ambient temperature.

3) For thermocouple inserts, the temperature class T6...T1 and the maximum surface temperature $T_{200} 85^{\circ}\text{C} \dots T_{200} 450^{\circ}\text{C}$ are equal to the process temperature.

2.3 When code **a** = ND, temperature assemblies with flying leads (code **g** = 0A) shall be provided with a round transmitter of max. 2.2 W with a main diameter not exceeding 45 mm and a sensor signal of max 10 Vdc and 1 mA.

2.4 When the product is installed in a place where EPL Ga is required, the user shall take effective measures to prevent the ignition hazard of the product housing due to impact or friction.

2.5 When the product is installed in a place where EPL Ga and the code **b** = B,C, electrostatic charges on the cable shall be avoided.

3. Conditions for Safe Use

3.1 Safety electrical data:

3.1.1 For suffix **a** =ND, Power supply:

transmitters: max. 42 Vdc, 23 mA

Sensor: max. 10Vdc, 1mA

3.1.2 For suffix **a** =NA

Supply/output circuit: in type of protection intrinsic safety Ex ia IIC and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:

Electrical Connection*1	Ui	li	Pi	Ci	Li
TMT71 2C	30V	100 mA	800 mW	0	0
TMT72 3A	30V	100 mA	800 mW	0	0
TMT82 3C, 3D, 3F, 3I	30 V	130 mA	800 mW	0	0
TMT84: 5A	FISCO field device				
TMT85: 4A	FISCO field device				
TMT86: 6B, 6C	FISCO field device				
Terminal block: 1A	30 V	140 mA	1000 mW	See tables below	
Flying leads: 0A*2	30 V	140 mA	1000 mW	See tables below	

*1: Suffix code **g***2: also applies for suffix code **b** = B, C = TSx310Ci and Li, for suffix code **g** = 0A, 1A

Sensor type	Neck Length E		Flying leads		Terminal block	
	Ci [F/m]	Li [H/m]	Ci [F/m]	Li [H]	Ci [F/m]	Li [H]
Single	2,00E-10	1,00E-06	1,96E-11	9,80E-08	4,60E-12	2,30E-08
Dual	4,00E-10	2,00E-06	3,92E-11	1,96E-07	9,20E-12	4,60E-08

Calculation formula for options with flying leads or terminal block only:

$$Ci = Ci_{\text{Neck Length E}} + Ci_{\text{Flying leads}}$$

$$Li = Li_{\text{Neck Length E}} + Li_{\text{Flying leads}}$$

$$Ci = Ci_{\text{Neck Length E}} + Ci_{\text{Terminal block}}$$

$$Li = Li_{\text{Neck Length E}} + Li_{\text{Terminal block}}$$

Ci and Li, for suffix code **b** = B, C:

Sensor type	Neck Length E		Cable Connection		Length Extension Wires L	
	Ci [F/m]	Li [H/m]	Ci [F/m]	Li [H]	Ci [F/m]	Li [H]
Single	2,00E-10	1,00E-06	2,50E-11	1,25E-08	2,00E-10	1,00E-06
Dual	4,00E-10	2,00E-06	5,00E-11	2,50E-07	4,00E-10	2,00E-06

Calculation formula for cable thermometer:

$$Ci = Ci_{\text{Neck Length E}} + Ci_{\text{Cable connection}} + Ci_{\text{Length Extension Wires L}} \times L$$

$$Li = Li_{\text{Neck Length E}} + Li_{\text{Cable connection}} + Li_{\text{Length Extension Wires L}} \times L$$

3.2 The user shall not change the configuration in order to maintain/ensure the explosion protection performance of the equipment. Any change may impair safety.

3.3 For installation, use and maintenance of this product, the end user shall observe the instruction manual and

the following standards:

GB/T 3836.13-2021 "Explosive atmospheres- Part 13:Equipment repair, overhaul, reclamation and modification".

GB/T 3836.15-2017 "Explosive atmospheres- Part 15:Electrical installations design, selection and erection".

GB/T 3836.16-2022 "Explosive atmospheres- Part 16:Electrical installations inspection and maintenance".

GB/T 3836.18-2024 "Explosive atmospheres- Part 18:Intrinsically safe electrical systems".

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

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

4. Manufacturer's Responsibility

4.1 Conditions for safe use and special conditions for safe use, as specified above, should be included in the documentation the user is provided with.

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

Shanghai Inspection and Testing
Institute of Instruments and Automation Systems Co. Ltd.
National Supervision and Inspection Center
for Explosion Protection and Safety of Instrumentation
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