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防爆合格证

证 号：GYJ23.1067X

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/芯子

型 号 规 格 iTHERM TS111, TS211, TS212

iTHERM TM111, TM131, TM112, TM151, TM152

防 爆 标 志 Ex ia II C T1...T6 Ga, Ex ia II C T1...T6 Ga/Gb, Ex ia III C
T20085°C...T200450°C Da/Db

产 品 标 准 /

图 样 编 号 10000003856, 10000009358, 10000010129

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 3836.4-2021, GB3836.20-2010

特颁发此证。

本证书有效期：2023年06月05日至2028年06月04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。
6. [更改 I]增加产品型号。2024年3月11日签发。

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 三 年 六 月 五 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. GYJ23.1067X

Manufacturer Endress + Hauser Wetzer GmbH + Co. KG
(Address: Obere Wank 1, 87484 Nesselwang, Germany)

Product Thermometer/Insert

Model iTHERM TS111, TS211, TS212
iTHERM TM111, TM131, TM112, TM151, TM152

Ex marking Ex ia IIC T1...T6 Ga, Ex ia IIC T1...T6 Ga/Gb, Ex ia IIIC
T₂₀₀85°C...T₂₀₀450°C Da/Db

Product standard /

Drawing number 10000003856, 10000009358, 10000010129

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

GB/T 3836.1-2021, GB/T 3836.4-2021, GB3836.20-2010

Valid until: 2028.06.04

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. Safe parameters specified in the attachment 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).
6. [Variation I] Add product model. issued on 2024.03.11.

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 2023.06.05

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



(GYJ23.1067X)

(Attachment II)

GYJ23.1067X 防爆合格证附件 II

由恩德斯+豪斯公司生产的iTHERM TS111, TS211, TS212, iTHERM TM111, TM131, TM112, TM151, TM152型温度计/芯子, 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 3836.4-2021 爆炸性环境 第4部分: 由本质安全型“i”保护的设

GB 3836.20 - 2010 爆炸性环境 第20部分: 设备保护级别 (EPL) 为Ga级的设备

产品防爆标志为Ex ia II C T1...T6 Ga、Ex ia II C T1...T6 Ga/Gb、Ex ia IIIC T₂₀₀85°C...T₂₀₀450°C Da/Db, 防爆合格证号为GYJ23.1067X。

一、产品安全使用特定条件

防爆合格证号后缀“X”表示该产品安全使用特定条件, 内容如下:

1、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。

2、潜在静电电荷危险, 仅允许使用湿布擦拭。

3、关联装置应优先选用隔离式安全栅; 如选用齐纳式安全栅, 应符合GB/T 3836.15-2017标准关于本安电路接地的要求。

4、温度参数:

带变送器模块

产品型号	装配变送器	温度组别	使用环境温度	最高表面温度
TM111	TMT84, TMT85	T6	-40°C~+55°C	T85°C
TM112	TMT162 PA/FF	T5	-40°C~+70°C	T100°C
TM131		T4	-40°C~+85°C	T135°C
TS111	TMT71, TMT72, TMT86 ¹	T6	-50°C~+55°C	T85°C
TM151	TMT162 HART	T5	-50°C~+70°C	T100°C
TM152	TMT142 HART	T4	-50°C~+85°C	T135°C
TS111	TMT82 ¹	T6	-50°C~+58°C	T85°C
TS211		T5	-50°C~+75°C	T100°C
TS212		T4	-50°C~+85°C	T135°C

	TMT8x, TMT7x 带显示	T6	-40℃~+55℃	T85℃
		T5	-40℃~+70℃	T100℃
		T4	-40℃~+85℃	T135℃

注：1防爆型式为Ex ia II C Ga/Gb的TMT82(不带显示)最低使用环境温度可至-52℃

产品型号	装配变送器	传感器直径	温度组别	介质温度范围	最高表面温度
TM111	TMT8x	3mm(1/8")	T6	-50℃~+66℃	T85℃
TM112	TMT7x	3mm(1/8")	T5	-50℃~+81℃	T100℃
TM131	TMT142	dual,	T4	-50℃~+116℃	T135℃
TS111		6mm(1/4")	T3	-50℃~+181℃	T200℃
TM151		dual	T2	-50℃~+276℃	T300℃
TM152			T1	-50℃~+426℃	T450℃
TS111		6mm(1/4")	T6	-50℃~+73℃	T85℃
TS211			T5	-50℃~+88℃	T100℃
TS212			T4	-50℃~+123℃	T135℃
			T3	-50℃~+188℃	T200℃
			T2	-50℃~+283℃	T300℃
			T1	-50℃~+433℃	T450℃

产品型号	装配变送器	传感器直径	温度组别	介质温度范围	最高表面温度
TM131	TMT162	3mm(1/8")	T6	-50℃~+64℃	T85℃
TM151		3mm(1/8")	T5	-50℃~+79℃	T100℃
TM152		dual,	T4	-50℃~+114℃	T135℃
TS211		6mm(1/4")	T3	-50℃~+179℃	T200℃
TS212		dual	T2	-50℃~+279℃	T300℃
			T1	-50℃~+424℃	T450℃
		6mm(1/4")	T6	-50℃~+71℃	T85℃
			T5	-50℃~+86℃	T100℃
			T4	-50℃~+121℃	T135℃
			T3	-50℃~+186℃	T200℃
			T2	-50℃~+286℃	T300℃
			T1	-50℃~+431℃	T450℃

不带变送器模块（仅对型号TS111, TS211, TS212）

传感器直径	温度组别	最高介质温度				
		Pi≤50mW	Pi≤100mW	Pi≤200mW	Pi≤500mW	Pi≤650mW
3mm(1/8"), 3mm(1/8") dual 或 6mm(1/4") dual	T1/T450℃	+426℃	+415℃	+396℃	+343℃	+333℃
	T2/T300℃	+276℃	+265℃	+246℃	+193℃	+183℃
	T3/T200℃	+181℃	+170℃	+151℃	+98℃	+88℃
	T4/T135℃	+116℃	+105℃	+86℃	+33℃	+23℃
	T5/T100℃	+81℃	+70℃	+51℃	-2℃	-12℃
	T6/T85℃	+66℃	+55℃	+36℃	-17℃	-27℃
6mm(1/4")	T1/T450℃	+433℃	+428℃	+420℃	+398℃	+388℃
	T2/T300℃	+283℃	+278℃	+270℃	+248℃	+238℃
	T3/T200℃	+188℃	+183℃	+175℃	+153℃	+143℃
	T4/T135℃	+123℃	+118℃	+110℃	+88℃	+78℃
	T5/T100℃	+88℃	+83℃	+75℃	+53℃	+43℃
	T6/T85℃	+73℃	+68℃	+60℃	+38℃	+28℃

传感器直径	温度组别	最高介质温度			使用环境温度*
		Pi≤750mW	Pi≤800mW	Pi≤1000mW	
3mm(1/8"), 3mm(1/8") dual 或 6mm(1/4") dual	T1/T450℃	+320℃	+312℃	+280℃	-40℃~+130℃
	T2/T300℃	+170℃	+162℃	+130℃	-40℃~+130℃
	T3/T200℃	+75℃	+62℃	+30℃	-40℃~+130℃
	T4/T135℃	+10℃	+2℃	-30℃	-40℃~+116℃
	T5/T100℃	-25℃	-33℃		-40℃~+81℃
	T6/T85℃	-40℃			-40℃~+66℃
6mm(1/4")	T1/T450℃	+381℃	+377℃	+361℃	-40℃~+130℃
	T2/T300℃	+231℃	+227℃	+211℃	-40℃~+130℃
	T3/T200℃	+136℃	+127℃	+111℃	-40℃~+130℃
	T4/T135℃	+71℃	+67℃	+51℃	-40℃~+123℃
	T5/T100℃	+36℃	+32℃	+16℃	-40℃~+88℃
	T6/T85℃	+21℃	+17℃	+1℃	-40℃~+73℃

注：1)*表壳为TA30A、TA30D或TA30且传感器型号为TS111, TS211或TS212时，最低使用环境温度为-50℃。仅防爆型式为Ex ia II C Ga/Gb的型号最低使用环境温度可达-60℃。

2)对于装配两个头部变送器的温度计，允许的环境温度比装配单个头部变送器的温度计允许的使用环境温度低12K。

3)对于芯子，温度等级T1...T6，最高表面温度T85℃...T450℃等于过程温度。

二、产品使用注意事项

1、电气参数：

变送器模块	电气参数
TMT71, TMT72	$U_i = 30V$ $I_i = 100mA$ $P_i = 800mW$ $C_i = 0$ $L_i = 0$
TMT82	$U_i = 30V$ $I_i = 130mA$ $P_i = 800mW$ $C_i = 0$ $L_i = 0$
TMT142 HART	$U_i = 30V$ $I_i = 300mA$ $P_i = 1000mW$ $C_i = 5nF$ $L_i = 0$
TMT162 HART	$U_i = 30V$ $I_i = 300mA$ $P_i = 1000mW$ $C_i = 0$ $L_i = 0$
TMT162 PA/FF	FISCO总线参数
TMT84, TMT85	FISCO总线参数
TMT86	FISCO总线参数
仅装端子座	$U_i = 30V$ $I_i = 140mA$ $P_i = 1000mW$ C_i 和 L_i 见下表
悬空引线	$U_i = 30V$ $I_i = 140mA$ $P_i = 1000mW$ C_i 和 L_i 见下表

对于型号为TS111,TS211和TS212的芯子：

传感器类型	插入深度 IL		悬空引线		端子座	
	Ci/m	Li/m	Ci	Li	Ci	Li
单支	200pF	1 μ H	56.4pF	282nH	4.6pF	23nH
双支	400pF	2 μ H	113pF	564nH	9.2pF	46nH

以下公式仅适用于安装端子座和悬空引线时：

$C_i = C_i IL \times IL + C_i$ 引出导线

$L_i = L_i IL \times IL + L_i$ 引出导线

$C_i = C_i IL \times IL + C_i$ 接线陶瓷端子

$L_i = L_i IL \times IL + L_i$ 接线陶瓷端子

2、产品必须与已通过防爆认证的关联装置配套共同组成本安防爆系统方可用于爆炸性气体环境。其系统接线必须同时遵守本产品 and 所配关联设备的使用说明书要求，接线端子不得接错。

3、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。

4、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 3836.18-2017 “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。

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
二〇二四年三月十一日

注：本证书附件替代原证书附件 I。

Ex
NEPSI



(GYJ23.1067X)

(Attachment II)

Attachment II to GYJ23.1067X

1. Description

Thermometer/Insert typed iTHERM TS111, TS211, TS212、 iTHERM TM111, TM131, TM112, TM151,

TM152 manufactured by Endress + Hauser Wetzler GmbH + Co. KG, accords with following standards:

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

GB/T 3836.4-2021 Explosive atmospheres-Part 4: Equipment protection by intrinsic safety “I”

GB 3836.20-2010 Explosive atmospheres-Part 20: Equipment with equipment protection level (EPL) Ga

The Ex marking is Ex ia II C T1...T6 Ga,Ex ia II C T1...T6 Ga/Gb, Ex ia III C T₂₀₀85°C...T₂₀₀450°C Da/Db,

its certificate number is GYJ23.1067X.

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, that is:

2.1 The device should be installed in a way that avoids mechanical sparks from mechanical shocks.

2.2 Potential electrostatic charge danger, only allow to use a wet cloth to wipe.

2.3 Isolated safety grid should be preferred for associated equipment; If Zener type safety grid is selected, it should meet the requirements of GB/T 3836.15-2017 standard on the grounding of intrinsic safety circuit.

2.4 Thermal data:

2.4.1 assembly with transmitters

type	transmitter	T class	ambient temperature	Maximum surface temperature
TM111	TMT84, TMT85	T6	-40°C ~ +55°C	T85°C
TM112	TMT162 PA/FF	T5	-40°C ~ +70°C	T100°C
TM131		T4	-40°C ~ +85°C	T135°C
TS111		T6	-50°C ~ +55°C	T85°C
TM151	TMT71, TMT72, TMT86 ¹	T5	-50°C ~ +70°C	T100°C
TM152	TMT162 HART	T6	-40°C ~ +55°C	T85°C
TS111		T5	-50°C ~ +70°C	T100°C
TS211				
TS212				

	TMT142 HART	T4	-50°C ~ +85°C	T135°C
	TMT82 ¹	T6	-50°C ~ +58°C	T85°C
		T5	-50°C ~ +75°C	T100°C
		T4	-50°C ~ +85°C	T135°C
	TMT8x, TMT7x with display	T6	-40°C ~ +55°C	T85°C
		T5	-40°C ~ +70°C	T100°C
		T4	-40°C ~ +85°C	T135°C

¹Lower temperature of -52°C for TMT82 only with gas Ex ia II C Ga/Gb and only without display.

type	transmitter	insert diameter	T class	process temperature	Maximum surface temperature
TM111	TMT8x	3mm(1/8'')	T6	-50°C ~ +66°C	T85°C
TM112	TMT7x	3mm(1/8'')	T5	-50°C ~ +81°C	T100°C
TM131	TMT142	dual,	T4	-50°C ~ +116°C	T135°C
TS111		6mm(1/4'')	T3	-50°C ~ +181°C	T200°C
TM151		dual	T2	-50°C ~ +276°C	T300°C
TM152			T1	-50°C ~ +426°C	T450°C
TS111					
TS211					
TS212		6mm(1/4'')	T6	-50°C ~ +73°C	T85°C
			T5	-50°C ~ +88°C	T100°C
			T4	-50°C ~ +123°C	T135°C
			T3	-50°C ~ +188°C	T200°C
			T2	-50°C ~ +283°C	T300°C
			T1	-50°C ~ +433°C	T450°C

type	transmitter	insert diameter	T class	process temperature	Maximum surface temperature
TM131	TMT162	3mm(1/8"), 3mm(1/8") dual, 6mm(1/4") dual	T6	-50°C ~ +64°C	T85°C
TM151			T5	-50°C ~ +79°C	T100°C
TM152			T4	-50°C ~ +114°C	T135°C
TS211			T3	-50°C ~ +179°C	T200°C
TS212			T2	-50°C ~ +279°C	T300°C
			T1	-50°C ~ +424°C	T450°C
			T6	-50°C ~ +71°C	T85°C
6mm(1/4")		T5	-50°C ~ +86°C	T100°C	
		T4	-50°C ~ +121°C	T135°C	
		T3	-50°C ~ +186°C	T200°C	
		T2	-50°C ~ +286°C	T300°C	
		T1	-50°C ~ +431°C	T450°C	

2.4.2 assembly without transmitters (TS111, TS211, TS212)

insert diameter	temperature class	maximum process temperature				
		Pi ≤ 50mW	Pi ≤ 100mW	Pi ≤ 200mW	Pi ≤ 500mW	Pi ≤ 650mW
3mm(1/8"), 3mm(1/8") dual or	T1/T450°C	+426°C	+415°C	+396°C	+343°C	+333°C
	T2/T300°C	+276°C	+265°C	+246°C	+193°C	+183°C
	T3/T200°C	+181°C	+170°C	+151°C	+98°C	+88°C
6mm(1/4") dual	T4/T135°C	+116°C	+105°C	+86°C	+33°C	+23°C
	T5/T100°C	+81°C	+70°C	+51°C	-2°C	-12°C
	T6/T85°C	+66°C	+55°C	+36°C	-17°C	-27°C
6mm(1/4")	T1/T450°C	+433°C	+428°C	+420°C	+398°C	+388°C

	T2/T300°C	+283°C	+278°C	+270°C	+248°C	+238°C
	T3/T200°C	+188°C	+183°C	+175°C	+153°C	+143°C
	T4/T135°C	+123°C	+118°C	+110°C	+88°C	+78°C
	T5/T100°C	+88°C	+83°C	+75°C	+53°C	+43°C
	T6/T85°C	+73°C	+68°C	+60°C	+38°C	+28°C

insert diameter	temperature class	maximum process temperature			ambient temperature *
		Pi ≤ 750mW	Pi ≤ 800mW	Pi ≤ 1000mW	
3mm(1/8"), 3mm(1/8") dual, 6mm(1/4") dual	T1/T450°C	+320°C	+312°C	+280°C	-40°C ~ +130°C
	T2/T300°C	+170°C	+162°C	+130°C	-40°C ~ +130°C
	T3/T200°C	+75°C	+62°C	+30°C	-40°C ~ +130°C
	T4/T135°C	+10°C	+2°C	-30°C	-40°C ~ +116°C
	T5/T100°C	-25°C	-33°C		-40°C ~ +81°C
	T6/T85°C	-40°C			-40°C ~ +66°C
6mm(1/4")	T1/T450°C	+381°C	+377°C	+361°C	-40°C ~ +130°C
	T2/T300°C	+231°C	+227°C	+211°C	-40°C ~ +130°C
	T3/T200°C	+136°C	+127°C	+111°C	-40°C ~ +130°C
	T4/T135°C	+71°C	+67°C	+51°C	-40°C ~ +123°C
	T5/T100°C	+36°C	+32°C	+16°C	-40°C ~ +88°C
	T6/T85°C	+21°C	+17°C	+1°C	-40°C ~ +73°C

1)* The ambient temperature at the terminal head may be directly influenced by the process temperature, but is restricted to the range -40°C ~ +130°C, besides for types TA30A, TA30D and TA30H and sensor, type TS111 or TS211 or TS212, with a restricted range -50°C ~ +130°C. The lower temperature of -60°C is only possible with the marking Ex ia II C Ga/Gb.

2) For thermometers with two mounted head transmitters the allowed ambient temperature is up to 12K lower

than each head transmitter's certified ambient temperature.

3) For thermocouple inserts, the temperature class T1...T6 and the maximum surface temperature T85°C ... T450°C are equal to the process temperature.

3. Conditions for Safe Use

3.1 Electrical data:

transmitter	electrical data
TMT71, TMT72	$U_i = 30V$ $I_i = 100mA$ $P_i = 800mW$ $C_i = 0$ $L_i = 0$
TMT82	$U_i = 30V$ $I_i = 130mA$ $P_i = 800mW$ $C_i = 0$ $L_i = 0$
TMT142 HART	$U_i = 30V$ $I_i = 300mA$ $P_i = 1000mW$ $C_i = 5nF$ $L_i = 0$
TMT162 HART	$U_i = 30V$ $I_i = 300mA$ $P_i = 1000mW$ $C_i = 0$ $L_i = 0$
TMT162 PA/FF	FISCO field devices
TMT84, TMT85	FISCO field devices
TMT86	FISCO field devices
Terminal block	$U_i = 30V$ $I_i = 140mA$ $P_i = 1000mW$ C_i & L_i see tables below
Flying leads	$U_i = 30V$ $I_i = 140mA$ $P_i = 1000mW$ C_i & L_i see tables below

Sensor type	Insertion length		Flying leads		Terminal block	
	Ci/m	Li/m	Ci	Li	Ci	Li
Single	200pF	1μH	56.4pF	282nH	4.6pF	23nH
Dual	400pF	2μH	113pF	564nH	9.2pF	46nH

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

$C_i = C_i IL \times IL + C_i$ Flying leads

$L_i = L_i IL \times IL + L_i$ Flying leads

$C_i = C_i IL \times IL + C_i$ Terminal block

$L_i = L_i IL \times IL + L_i$ Terminal block

3.2 This product should be used in explosive gas atmospheres together with approved associated apparatus, follow the instruction manual of this product and associated apparatus when connecting the wiring. Connect the

wiring terminals correctly.

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

3.4 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 3836.18-2017 "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

2024.03.11

Note: This certificate annex replaces the original certificate Annex I .