CERTIFICATE OF CONFORMITY

FM Approvals
Member of the FM Global Group

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** **FM21US0103X**
3. **Equipment:** **TT*200,TT*300, TT*300-N Temperature Transmitter**
   (Type Reference and Name) **and TSP341-N Temperature Sensor**
4. **Name of Listing Company:** **ABB AG**
5. **Address of Listing Company:** **Schillerstraße 72, Minden 32425, Germany**
6. The examination and test results are recorded in confidential report number:

   PR459291 dated 4th September 2022

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   FM 3600:2022, FM 3610:2021, FM 3611:2021, FM 3615:2022, FM 3810:2021, NEMA 250:2008, ANSI/UL 60079-0:2020, ANSI/UL 60079-11:2018, ANSI/UL 60079-15:2017, ANSI/IEC 60529:2020, ANSI/UL 61010-1:2012

8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.
10. Equipment Ratings:

    See Annex

11. The marking of the equipment shall include:

    See Annex

12. **Description of Equipment:**

    The TT*200 and TT*300 transmitter are designed for process temperature measurements using RTD's, thermocouples or sensors with defined resistance or direct voltage quantities. All signal outputs are available in

Certificate issued by:

J.E. Marquedant
VP, Manager - Electrical Systems

8 August 2023
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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4 to 20 mA and HART communications. The TT*200 and TT*300 are available in three variants, a field mount enclosure which is made of aluminum or stainless steel, a rail mount version and a head mount (hockey puck) version. The field mount and head mount versions have an optional HMI.

The TSP341-N is a non-invasive temperature sensor that contains fixed temperature measurement insets connected to a TT*300-N transmitter in either a head mounted or remote configuration (TSP341-N without Transmitter).

See Annex for model codes.

Ratings
The ambient operating temperature range of the TT*200 and TT*300 temperature transmitter is -50°C to 85°C. Process measurement is made remotely from the transmitter.

The TTF200 and TTF300 enclosures are rated for an ingress protection of Type 4X, IP66 and IP67.

The ambient operating temperature range of the TSP341-N temperature transmitter is -50°C to 85°C or -40°C to 85°C depending on the option chosen.
The TSP341-N enclosures are rated for an ingress protection of Type 4X, IP66 and IP67.

The ambient operating temperature range of the BUZ enclosure is -45°C to 101°C.
The BUZ enclosure has an ingress rating of IP65.

Electrical data:
In Type of Protection intrinsic safety and non-incendive,

Energy limitation parameters:
$U_i \leq 30Vdc$; $I_i \leq 130mA$; $P_i \leq 0.8W$; $C_i = 0.57nF$; $L_i = 160\mu H$

All other protection types:
$U \leq 30Vdc$; $I = 4…20mA$; $P \leq 0.8W$

Output parameters
$U_o = 6.5\ V$; $I_o = 17.8\ mA$; $P_o = 29\ mW$; $C_o \leq 1.65\ \mu F$; $L_o \leq 5.0\ mH$

TSP341-N without Transmitter
$U \leq 6.5V$ $I \leq 25\ mA$ $P \leq 29mW$

13. **Specific Conditions of Use:**

See Annex for Specific Conditions of Use

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14. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
4 September 2022	Original Issue.
10 March 2023	Supplement 1: Report Reference: RR235567 dated 10th March 2023. Description of the Change: Correction to Listing.
8 August 2023	Supplement 2: Report Reference: RR236778 dated 8 August 2023. Description of the Change(s): Addition of TSP341-N sensor

ANNEX

TSP341-N-L1YbNcB1Y6Ud - temperature sensor

Equipment Ratings:

Intrinsically safe for Class I, Division 1, Groups A, B, C, D; T6, T4; Intrinsically safe for Zone 0, AEx ia IIC T6, T4 Ga; Intrinsically safe for Zone 1, AEx ia IIC T6, T4 Gb; hazardous (classified) locations, indoors and outdoors (IP65) with an ambient temperature rating of -40°C to 116°C using the entity concept when installed per TSP341-N-L1YB.

Markings:

I.S. for Class I, Division 1, Groups A, B, C, D, T6, T4 Entity TSP341-N-L1YB
Zone 0, AEx ia IIC T6, T4 Ga, Entity TSP341-N-L1YB
Zone 1, AEx ib IIC T6, T4 Gb, Entity TSP341-N-L1YB
-40°C ≤ Ta ≤ 116°C
IP65

Description of Equipment:

b = Process connection; 00, 14, 15, 31, 32, 33, 34, 41, 42, 43, 51, 52 or 53
c = Extension tube length: 1, 2, 3, 4, 5, 6, 7, 8 or 9
d = Cable entry: 1, 2 or 3

Specific Conditions of Use:

1. For Intrinsic Safety Approvals the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 for a Maximum Ambient Temperature of 56°C
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 116°C

2. The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
3. The service temperature inside the enclosure of the TSP341-N temperature sensor represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot be exceeded.
4. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TSP341-N temperature sensor s higher than 60°C.

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TSP341-N-L1YbNcd1Y6Uf - temperature sensor

Equipment Ratings:

Intrinsically safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F, G; T6, T4; Intrinsically safe for Zone 0, AEx ia IIC T6, T4 Ga; Intrinsically safe for Zone 1, AEx ia IIC T6, T4 Gb; hazardous (classified) locations, indoors and outdoors (IP65) with an ambient temperature rating of -40°C to 116°C using the entity concept when installed per TSP341-N-L1Y.

Markings:

I.S. for Class I, Division 1, Groups A, B, C, D, E, F, G, T6, T4 Entity TSP341-N-L1Y
Zone 0, Ex ia IIC T6, T4 Ga, Entity TSP341-N-L1Y
Zone 1, Ex ia IIC T6, T4 Gb, Entity TSP341-N-L1Y
-40°C ≤ Ta ≤ 116°C
IP65

Description of Equipment:

b = Process connection; 00, 14, 15, 31, 32, 33, 34, 41, 42, 43, 51, 52 or 53
c = Extension tube length: 1, 2, 3, 4, 5, 6, 7, 8 or 9
d = Housing: L or S
f = Cable entry: 1, 2 or 3

Specific Conditions of Use:

1. For Intrinsic Safety Approvals the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 or T5 for a Maximum Ambient Temperature of 56°C
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 116°C

2. The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
3. The service temperature inside the enclosure of the TSP341-N temperature sensor represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot be exceeded.
4. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TSP341-N temperature sensor is higher than 60°C.

TSP341-N-L1YbNcdH9Ufg - temperature transmitter

Equipment Ratings:

Intrinsically safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F, G; T6, T4; Intrinsically safe for Zone 0, AEx ia IIC T6, T4 Ga; Intrinsically safe for Zone 1, AEx ia IIC T6, T4 Gb; hazardous (classified) locations, indoors and outdoors

(Type 4X, IP66/67) with an ambient temperature rating of -40°C to 81°C using the entity concept when installed per TSP341-N-L1H.

Markings:

I.S. for Class I, II, III, Division 1, Groups A, B, C, D, E, F, G T6, T4 Entity TSP341-N-L1H
Zone 0, AEx ia IIC T6, T4 Ga, Entity TSP341-N-L1H
Zone 1, AEx ia IIC T6, T4 Gb, Entity TSP341-N-L1H
-40°C ≤ Ta ≤ 81°C
Type 4X, IP66/67

Description of Equipment:

b = Process connection; 00, 14,15, 31, 32, 33, 34, 41, 42, 43, 51, 52 or 53
c = Extension tube length: 1, 2, 3, 4, 5, 6, 7, 8 or 9
d = Housing/Display: L1, L2, S1 or S4
f = Cable entry: 1, 2 or 3
g = Display: Blank, L1, L2, L3 or L4

Specific Conditions of Use:

1. For Intrinsic Safety Approvals the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 for a Maximum Ambient Temperature of 56°C
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 81°C

2. The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
3. The service temperature inside the enclosure of the TSP341-N temperature sensor represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot be exceeded.
4. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TSP341-N temperature sensor is higher than 60°C.

TSP341-N-L2YbNcB1Y6Ud - temperature sensor

Equipment Ratings:

Nonincendive for Class I, Division 2, Groups A, B, C, D; T6, T4; Zone 2, AEx nA IIC T6, T4 Gc; Zone 2, AEx ec IIC T6, T4 Gc; hazardous (classified) locations, indoors and outdoors (IP65) with an ambient temperature rating of -40°C to 96°C using the nonincendive field wiring concept when installed per TSP341-N-L2YB.

Markings:

Zone 2, AEx nA IIC T6, T4 Gc
Zone 2, AEx ec IIC T6, T4 Gc
Class I, Division 2, Groups A, B, C, D T6, T4; NIFW TSP341-N-L2YB

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-40°C ≤ Ta ≤ 96°C
IP65

Description of Equipment:

b = Process connection; 00, 14, 15, 31, 32, 33, 34, 41, 42, 43, 51, 52 or 53
c = Extension tube length: 1, 2, 3, 4, 5, 6, 7, 8 or 9
d = Cable entry: 1, 2 or 3

Specific Conditions of Use:

1. For Nonincendive Approvals the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 for a Maximum Ambient Temperature of 56°C
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 96°C

2. When installed as AEx nA or AEx ec the TSP341-N

- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage at the supply terminals to the equipment.
- The connecting cables shall be installed in a fixed position and secured against tensile loads.

3. The service temperature inside the enclosure of the TSP341-N temperature sensor represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot be exceeded.
4. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TSP341-N temperature sensor is higher than 60°C.

TSP341-N-L2YbNcd1Y6Uf - temperature sensor

Equipment Ratings:

Nonincendive for Class I, II, III Division 2, Groups A, B, C, D, E, F, G; T6, T4; Zone 2, AEx nA IIC T6, T4 Gc; Zone 2, AEx ec IIC T6, T4 Gc; hazardous (classified) locations, indoors and outdoors (Type 4X, IP66/67) with an ambient temperature rating of -40°C to 96°C using the nonincendive field wiring concept when installed per TSP341-N-L2Y

Markings:

Zone 2, AEx nA IIC T6, T4 Gc
Zone 2, AEx ec IIC T6, T4 Gc
Class I, II, III, Division 2, Groups A, B, C, D , E, F, G T6, T4; NIFW TSP341-N-L2Y
-40°C ≤ Ta ≤ 96°C
Type 4X, IP66/67

Description of Equipment:

b = Process connection; 00, 14,15, 31, 32, 33, 34, 41, 42, 43, 51, 52 or 53

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c = Extension tube length: 1, 2, 3, 4, 5, 6, 7, 8 or 9
d = Housing: L or S
f = Cable entry: 1, 2 or 3

Specific Conditions of Use:

1. For Nonincendive Approvals the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 for a Maximum Ambient Temperature of 56°C
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 96°C

2. When installed as AEx nA or AEx ec the TSP341-N

- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage at the supply terminals to the equipment.
- The connecting cables shall be installed in a fixed position and secured against tensile loads.

3. The service temperature inside the enclosure of the TSP341-N temperature sensor represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot be exceeded.
4. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TSP341-N temperature sensor is higher than 60°C.

TSP341-N-L2YbNcdH9Ufg - temperature transmitter

Equipment Ratings:

Nonincendive for Class I, II, III Division 2, Groups A, B, C, D, E, F, G; T6, T4; Zone 2, AEx nA IIC T6, T4 Gc; Zone 2, AEx ec IIC T6, T4 Gc; hazardous (classified) locations, indoors and outdoors (Type 4X, IP66/67) with an ambient temperature rating of -40°C to 81°C using the nonincendive field wiring concept when installed per TSP341-N-L2H

Markings:

Zone 2, AEx nA IIC T6, T4 Gc
Zone 2, AEx ec IIC T6, T4 Gc
Class I, II, III, Division 2, Groups A, B, C, D , E, F, G T6, T4; NIFW TSP341-N-L2H
-40°C ≤ Ta ≤ 81°C
Type 4X, IP66/67

Description of Equipment:

b = Process connection; 00, 14,15, 31, 32, 33, 34, 41, 42, 43, 51, 52 or 53
c = Extension tube length: 1, 2, 3, 4, 5, 6, 7, 8 or 9
d = Housing/Display: L1, L2, S1 or S4
f = Cable entry: 1, 2 or 3
g = Display: Blank, L1, L2, L3 or L4

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Specific Conditions of Use:

1. For Nonincendive Approvals the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 or T5 for a Maximum Ambient Temperature of 56°C
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 81°C

2. When installed as AEx nA or AEx ec the TSP341-N;

- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage at the supply terminals to the equipment.
- The connecting cables shall be installed in a fixed position and secured against tensile loads.

3. The service temperature inside the enclosure of the TSP341-N temperature sensor represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot be exceeded.
4. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TSP341-N temperature sensor is higher than 60°C.

TTF200-a1bcHde - field mounted temperature transmitter

Equipment Ratings:

Intrinsically safe for Class I, II, & III, Division 1, Groups A, B, C, D, E, F & G, T6, T4; Intrinsically safe for Class I, Zone 0, AEx ia IIC T6...T4 Ga; Intrinsically safe for Class I, Zone 1 with connections to Zone 0, AEx ib [ia Ga] IIC T6...T1 Gb; Intrinsically safe for Class I, Zone 1 with connections to Zone 20, AEx ib IIC T6...T1 Gb / [AEx ia Da] IIIC, hazardous (classified) locations. When installed using the Entity concept per Control drawing TTF200-L1H. Indoor and outdoor Type 4X, IP66 and IP67.

Markings:

I.S. for Class I, Division 1, Groups A, B, C, D, E, F, G; T6, T4 ; Entity – TTF200-L1H
AEx ia IIC T6...T4 Ga; Entity – TTF200-L1H
AEx ib [ia Ga] IIC T6...T4 Gb; Entity – TTF200-L1H
AEx ib IIC T6...T4 Gb / [AEx ia Da] IIIC; Entity – TTF200-L1H
-50°C ≤ Ta ≤ 85°C
Type 4X, IP66, IP67

Description of Equipment:

a = L or R
b = Housing/Display: A, B, E, or F
c = Cable entry:1, 2, or 3
d = Extended ambient, blank or SE
e = manufacturer specific extensions which are not relevant to safety.

Specific Conditions of Use:

1. For Intrinsic Safety the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 or T5 for a Maximum Ambient Temperature of 56°C
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 85°C

2. The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
3. The service temperature inside the enclosure of the TTF200 temperature measuring transducer represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot be exceeded.
4. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TTF200 temperature measuring transducer is higher than 60°C.

TTF200-a2bcHde – field mounted temperature transmitter

Equipment Ratings:

Nonincendive for Class I, Division 2, Groups A, B, C, D; T6, T4 using the nonincendive field wiring concept when installed per TTF200-L2H; Type of Protection n for Zone 2, AEx nA IIC T6...T4 Ga; Increased safety for Zone 2 AEx ec IIC T6...T4 Gb hazardous (classified) locations, indoors and outdoors (Type 4X, IP66/67) with an ambient temperature rating of -50°C to +85°C.

Markings:

Class I, Division 2, Groups A, B, C, D; T6, T4 -50°C ≤ Ta ≤ 85°C; NIFW – TTF200-L2H
AEx nA IIC T6...T4 Gc -50°C ≤ Ta ≤ 85°C
AEx ec IIC T6...T4 Gc -50°C ≤ Ta ≤ 85°C
Type 4X, IP66, IP67

Description of Equipment:

a = L or R
b = Housing/Display: A, B, E, or F
c = Cable entry:1, 2, or 3
d = Extended ambient, blank or SE
e = manufacturer specific extensions which are not relevant to safety.

Specific Conditions of Use:

1. For Nonincendive the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 or T5 for a Maximum Ambient Temperature of 56°C
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 85°C

2. When installed as Ex nA or Ex ec the TTF200;

- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage at the supply terminals to the equipment.
- The connecting cables shall be installed in a fixed position and secured against tensile loads.

3. The service temperature inside the enclosure of the TTF200 temperature measuring transducer represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot be exceeded.
4. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TTF200 temperature measuring transducer is higher than 60°C.

TTF200-a3bcHde – field mounted temperature transmitter

Equipment Ratings:

Explosionproof with Intrinsically safe outputs for Class I, Division 1, Groups A, B, C, D T6, T4 using the Entity concept when installed per TTF200-L3H. Explosionproof for Class I, Division 1 Groups A ,B, C, D; T6, T4; Dust-ignitionproof for Class II, III, Division 1, Groups E, F, G; T6, T4; Flameproof for Zone 1 with intrinsically safe outputs for Zone 0, Zone 1 AEx db [ia Ga] IIC T6...T4 using the Entity concept when installed per TTF200-L3H hazardous (classified) locations, indoors and outdoors (Type 4X, IP66/67) with an ambient temperature rating of -50°C to +85°C.

Markings:

Class I, Division 1, Groups A, B, C, D; T6, T4; -50°C ≤ Ta ≤ 85°C; Entity – TTF200-L3H
Class I, Division 1, Groups A, B, C, D; T6, T4; -50°C ≤ Ta ≤ 85°C
Class II, III, Groups E, F, G; T6, T4; -50°C ≤ Ta ≤ 85°C
Zone 1, AEx db [ia Ga] IIC T6…T4 Gb -50°C ≤ Ta ≤ 85°C; Entity – TTF200-L3H
Type 4X, IP66, IP67

Description of Equipment:

a = L or R
b = Housing/Display: A, B, E, or F
c = Cable entry:1, 2, or 3
d = Extended ambient, blank or SE
e = manufacturer specific extensions which are not relevant to safety.

Specific Conditions of Use:

1. For Explosionproof and Dust-Ignitionproof Approvals the Temperature code and Ambient temperatures are as follows

- T** = Temperature Code T6 for a Maximum Ambient Temperature of 56°C
- T** = Temperature Code T5 for a Maximum Ambient Temperature of 71°C
- T** = Temperature Code T4 for a Maximum Ambient Temperature of 85°C

2. The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
3. Contact the manufacturer for specific flamepath joint details during repair of flameproof AEx db and Explosionproof apparatus.
4. The service temperature inside the enclosure of the TTFx00 temperature measuring transducer represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot be exceeded.
5. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TTFx00 temperature measuring transducer is higher than 60°C.

To verify the availability of the Approved product, please refer to www.approvalguide.com

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TTF200-a7bcHde – field mounted temperature transmitter

Equipment Ratings:

Intrinsically safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F, G T6, T4; Zone 0, AEx ia IIC T6...T1 Ga; Zone 1 with connections to Zone 0, AEx ib [ia Ga] IIC T6...T4 Gb; Zone 1 with connections to Zone 20, AEx ib IIC T6...T1 Gb / [AEx ia Ga] IIIC; Explosionproof with intrinsically safe outputs for Class I, Division 1, Groups A, B, C, D, T6, T4; Explosionproof for Class I, Division 1, Groups A, B, C, D, T6, T4; Dust ignitionproof for Class II, III, Groups E, F, G T6, T4; Flameproof with intrinsically safe outputs Zone 1 with connection to Zone 0, AEx db [ia Ga] IIC T6...T4 Gb hazardous (classified) locations indoor and outdoor (Type 4X, IP66, IP67) ambient temperature range -50°C ≤ Ta ≤ 85°C using the entity concept when installed per TTF200-L1H.

Markings:

I.S. for Class I, II, III; Division 1, Groups A, B, C, D, E, F, G; T6, T4; ; Entity – TTF200-L1H
Zone 0, AEx ia IIC T6...T1 Ga Entity – TTF200-L1H
Zone 1, AEx ib [ia Ga] IIC T6...T4 Gb; Entity – TTF200-L1H
Zone 1, AEx ib IIC T6…T1 Gb / [AEx ia Da] IIIC; Entity – TTF200-L1H
Class I, Division 1, Groups A, B, C, D; T6, T4 Entity – TTF200-L3H
Class I, Division 1, Groups A, B, C, D; T6, T4
Class II, III, Division 1, Groups E, F, G; T6, T4
Zone 1, AEx db [ia Ga] IIC T6...T4 Gb Entity – TTF200-L3H
-50°C ≤ Ta ≤ 85°C
Type 4X, IP66, IP67

Description of Equipment:

a = L or R
b = Housing/Display: A, B, E, or F
c = Cable entry:1, 2, or 3
d = Extended ambient, blank or SE
e = manufacturer specific extensions which are not relevant to safety.

Specific Conditions of Use:

1. For Intrinsic Safety Approvals the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 or T5 for a Maximum Ambient Temperature of 56°C
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 85°C

2. For Explosionproof and Dust-Ignitionproof Approvals the Temperature code and Ambient temperatures are as follows

- T** = Temperature Code T6 for a Maximum Ambient Temperature of 56°C
- T** = Temperature Code T5 for a Maximum Ambient Temperature of 71°C
- T** = Temperature Code T4 for a Maximum Ambient Temperature of 85°C

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3. The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
4. Contact the manufacturer for specific flamepath joint details during repair of flameproof AEx d apparatus.
5. The service temperature inside the enclosure of the TTFx00 temperature measuring transducer represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot be exceeded.
6. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TTFx00 temperature measuring transducer is higher than 60°C.

TTF300-ab1cdHef – field mounted temperature transmitter

Equipment Ratings:

Intrinsically safe for Class I, Division 1, Groups A, B, C, D, E, F, G; T6, T4; Intrinsically safe for Zone 0, AEx ia IIC T6...T4 Ga; Intrinsically safe for Zone 1 with intrinsically safe outputs for Zone 0, Zone 1, AEx ib [ia Ga] IIC T6...T4 Gb; Intrinsically safe for Zone 1 with intrinsically safe outputs for Zone 20, Zone 1, AEx ib IIC T6...T4 Gb / [Ex ia Da] IIIC; hazardous (classified) locations, indoors and outdoors (Type 4X, IP66/67) with an ambient temperature rating of -50°C to +85°C using the Entity concept when installed per TTF200-L1H.

Markings:

I.S. for Class I, II, III; Division 1, Groups A, B, C, D, E, F, G; T6, T4; -50°C ≤ Ta ≤ 85°C; Entity – TTF300-L1H
Zone 0, AEx ia IIC T6...T4 Ga -50°C ≤ Ta ≤ 85°C; Entity – TTF300-L1H
Zone 1, AEx ib [ia Ga] IIC T6...T4 Gb Ta = 85°C; Entity – TTF300-L1H
Zone 1, AEx ib IIC T6…T4 Gb Ta = 85°C / [Ex ia Da] IIIC; Entity – TTF300-L1H
Type 4X, IP66, IP67

Description of Equipment:

a = Measurement: Blank or N
b = L or R
c = Housing/Display: A, B, C, or D
d = Cable entry:1, 2, or 3
e = Extended ambient, blank or SE
f = Manufacturer specific extensions – Not relevant to safety

Specific Conditions of Use:

1. For Intrinsic Safety Approvals the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 or T5 for a Maximum Ambient Temperature of 56°C
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 85°C

2. The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
3. The service temperature inside the enclosure of the TTFx00 temperature measuring transducer represents the

specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot be exceeded.
4. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TTFx00 temperature measuring transducer is higher than 60°C.

TTF300-ab2bcHde – field mounted temperature transmitter

Equipment Ratings:

Nonincendive for Class I, Division 2, Groups A, B, C, D, E, F, G; T6, T4 using the nonincendive field wiring concept when installed per TTF200-L2H; Type of Protection n for Zone 2, AEx nA IIC T6...T4 Ga; Increased safety for Zone 2 AEx ec IIC T6...T4 Gb hazardous (classified) locations, indoors and outdoors (Type 4X, IP66/67) with an ambient temperature rating of -50°C to +85°C.

Markings:

Class I, II, III, Division 2, Groups A, B, C, D, E, F, G; T6, T4; NIFW – TTF300-L2H
Zone 2, AEx nA IIC T6…T1 Gc
Zone 2, AEx ec IIC T6…T1 Gc
-50°C ≤ Ta ≤ 85°C
Type 4X, IP66, IP67

Description of Equipment:

a = Measurement: Blank or N
b = L or R
c = Housing/Display: A, B, C, or D
d = Cable entry:1, 2, or 3
e = Extended ambient, blank or SE
f = Manufacturer specific extensions – Not relevant to safety

Specific Conditions of Use:

1. For Nonincendive Approvals the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 or T5 for a Maximum Ambient Temperature of 56°C
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 85°C

2. When installed as AEx nA or AEx ec the TTF300;

- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage at the supply terminals to the equipment.
- The connecting cables shall be installed in a fixed position and secured against tensile loads.

3. The service temperature inside the enclosure of the TTFx00 temperature measuring transducer represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot

be exceeded.
4. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TTFx00 temperature measuring transducer is higher than 60°C.

TTF300-ab3cdHef – field mounted temperature transmitter

Equipment Ratings:

Flameproof for Zone 1 with intrinsically safe connections for Zone 0, AEx db [ia Ga] IIC T6...T1 Gb and Explosionproof with intrinsically safe connections for Class I, Division 1. Groups A, B, C, D T6, T4 hazardous locations when installed per the Entity concept and control drawing TTF300-L3H; Explosionproof for Class I, Division 1. Groups A, B, C, D T6, T4; Dust-ignition proof for Class II, III Division 1, Groups E, F, G T6, T4 hazardous locations. Indoors and outdoors (Type 4X, IP66/67). Ambient temperature range -50°C ≤ Ta ≤ 85°C.

Markings:

Zone 1 AEx db [ia Ga] IIC T6...T4 Gb Entity – TTF300-L3H
Class I, Division 1, Groups A, B, C, D; T6, T4 with connections to intrinsically safe circuits Entity – TTF300-L3H
Class I, Division 1, Groups A, B, C, D: T6...T4
Class II, III, Division 1, Groups E, F, G: T6...T4
-50°C ≤ Ta ≤ 85°C
Type 4X, IP66, IP67

Description of Equipment:

a = Measurement: Blank or N
b = L or R
b = Housing/Display: A, B, C, or D
c = Cable entry:1, 2, or 3
d = Extended ambient, blank or SE
e = Manufacturer specific extensions – Not relevant to safety

Specific Conditions of Use:

1. For Explosionproof and Dust-Ignitionproof Approvals the Temperature code and Ambient temperatures are as follows

- T** = Temperature Code T6 for a Maximum Ambient Temperature of 56°C
- T** = Temperature Code T5 for a Maximum Ambient Temperature of 71°C
- T** = Temperature Code T4 for a Maximum Ambient Temperature of 85°C

2. The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
3. Contact the manufacturer for specific flamepath joint details during repair of flameproof AEx d or Explosionproof apparatus.
4. The service temperature inside the enclosure of the TTFx00 temperature measuring transducer represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot

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be exceeded.
5. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TTFx00 temperature measuring transducer is higher than 60°C.

TTF300-ab7cdHef – field mounted temperature transmitter

Equipment Ratings:

Intrinsically safe for Class I, II, III, Division 1, Groups A, B, C, D, E, F, G; T6, T4; Intrinsically safe for Zone 0, AEx ia IIC T6...T4 Ga; Intrinsically safe for Zone 1 with intrinsically safe outputs for Zone 0, Zone 1, AEx ib [ia Ga] IIC T6...T4 Gb; Intrinsically safe for Zone 1 with intrinsically safe outputs for Zone 20, Zone 1, AEx ib IIC T6...T4 Gb / [AEx ia Da] IIIC; hazardous (classified) locations, indoors and outdoors (Type 4X, IP66/67) with an ambient temperature rating of -50°C to +85°C using the Entity concept when installed per TTF300-L1H.

Markings:

I.S. for Class I, II, III, Division 1, Groups A,B,C,D,E,F,G; T6...T4; ; Entity – TTF300-L1H
Zone 0 AEx ia IIC T6...T4 Ga; Entity – TTF300-L1H
Zone 1 AEx ib [ia Ga] IIC T6...T4 Gb Entity – TTF300-L1H
Zone 1 AEx ib IIC T6...T4 Gb / [AEx ia Da] IIIC; Entity – TTF300-L1H
Zone 1 AEx db [ia Ga] IIC T6...T4 Gb Entity – TTF300-L3H
Class I, Division 1, Groups A, B, C, D; T6...T4 with connections to intrinsically safe circuits Entity – TTF300-L3H
Class I, Division 1, Groups A, B, C, D; T6...T4
Class II, III, Division 1, Groups E, F, G T6…T4
50°C ≤ Ta ≤ 85°C
Type 4X, IP66, IP67

Description of Equipment:

a = Measurement: Blank or N
b = L or R
c = Housing/Display: A, B, C, or D
d = Cable entry:1, 2, or 3
e = Extended ambient, blank or SE
f = Manufacturer specific extensions – Not relevant to safety

Specific Conditions of Use:

1. For Intrinsic Safety Approvals the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 or T5 for a Maximum Ambient Temperature of 56°C
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 85°C

2. For Explosionproof and Dust-Ignitionproof Approvals the Temperature code and Ambient temperatures are as follows

- T** = Temperature Code T6 for a Maximum Ambient Temperature of 56°C

- T** = Temperature Code T5 for a Maximum Ambient Temperature of 71°C
- T** = Temperature Code T4 for a Maximum Ambient Temperature of 85°C

3. The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.
4. Contact the manufacturer for specific flamepath joint details during repair of flameproof AEx d apparatus.
5. The service temperature inside the enclosure of the TTFx00 temperature measuring transducer represents the specified permissible ambient temperature. With the installation it shall be ensured that this service temperature cannot be exceeded.
6. Heat-resistant connection cables shall be used if the temperature at the cable entries or inside the enclosure of the TTFx00 temperature measuring transducer is higher than 60°C.

TTH200-aHbc – head mounted temperature transmitter

Equipment Ratings:

I.S. for Class I, Division 1, Groups A, B, C, D: T6, T4: Intrinsically safe for Zone 0, AEx ia IIC T6...T4 Ga; Intrinsically safe for Zone 1 with connections to Zone 0, AEx [ia Ga] ib IIC T6...T4; Intrinsically safe for Zone 1 with connections to Zone 20, AEx ib IIC T6...T4 Gb / [AEx ia Da] IIIC hazardous (classified) locations using the entity concept per TTH200-L1H; Nonincendive for Class I, Division 2, Groups A, B, C , D, T6, T4 hazardous (classified) locationsusing the nonincendive field wiring concept per TTH200-L2H; Type of protection "n" for Zone 2, AEx nA IIC T6...T4 Gc hazardous (classified) locations ; Increased safety "ec" for Zone 2, AEx ec IIC T6...T4 Gc hazardous (classified) locations indoor and outdoor locations when using an IP54 NRTL enclosure. Ambient temperature range -50°C ≤ Ta ≤ 85°C

Markings:

I.S. for Class I, Division 1, Groups A, B, C, D: T6, T4: Entity – TTH200-L1H
Zone 0, AEx ia IIC T6...T4 Ga : Entity – TTH200-L1H
Zone 0, AEx [ia Ga] ib IIC T6...T4; Entity TTH200-L1H
Zone 1 AEx ib IIC T6...T4 Gb / [AEx ia Da] IIIC Entity – TTH200-L1H
Class I, Division 2, Groups A, B, C, D T6, T4: NIFW – TTH200-L2H
Zone 2, AEx nA IIC T6...T4 Gc
Zone 2, AEx ec IIC T6...T4 Gc
-50°C ≤ Ta ≤ 85°C;

Description of Equipment:

a = L1, L2, R1 or R2
b = Extended ambient, blank or SE
c = manufacturer specific extensions which are not relevant to safety

Specific Conditions of Use:

1. For Intrinsic Safety and Nonincendive Approvals the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 or T5 for a Maximum Ambient Temperature of 56°C.

- T* = Temperature Code T4 for a Maximum Ambient Temperature of 85°C.

2. The TTH200 shall always be used with an IP54 NRTL Certified enclosure.
3. When installed as Ex nA or Ex ec the TTH300;

- shall always be installed in an NRTL Certified enclosure that provides a minimum ingress protection of IP54 in accordance with UL 60079-0 and at least pollution degree 2, as defined in UL 60664-1.
- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage at the supply terminals to the equipment.
- The connecting cables shall be installed in a fixed position and secured against tensile loads.

TTH300-abHcd – head mounted temperature transmitter

Equipment Ratings:

Intrinsically safe for Class I, Division 1, Groups A, B, C, D: T6, T4: Intrinsically safe for Zone 0, AEx ia IIC T6...T4 Ga; Intrinsically safe for Zone 1 with connections to Zone 0, AEx [ia Ga] ib IIC T6...T4; Intrinsically safe for Zone 1 with connections to Zone 20, AEx ib IIC T6...T4 Gb / [AEx ia Da] IIIC hazardous (classified) locations using the entity concept per TTH300-L1H; Nonincendive for Class I, Division 2, Groups A, B, C , D, T6, T4 hazardous (classified) locations using the nonincendive field wiring concept per TTH300-L2H; Type of protection "n" for Zone 2, AEx nA IIC T6...T4 Gc hazardous (classified) locations ; Increased safety "ec" for Zone 2, AEx ec IIC T6...T4 Gc hazardous (classified) locations indoor and outdoor locations when using an IP54 NRTL enclosure. Ambient temperature range -50°C ≤ Ta ≤ 85°C

Markings:

I.S. for Class I, Division 1, Groups A, B, C, D: T6, T4 Entity – TTH300-L1H
Zone 0, Ex ia IIC T6...T4 Ga : Entity – TTH300-L1H
Zone 0, Ex [ia Ga] ib IIC T6...T4; : Entity – TTH300-L1H
Zone 1 Ex ib IIC T6...T4 Gb / [20] [Ex ia Da] IIIC Entity – TTH300-L1H
Class I, Division 2, Groups A, B, C, D T6, T4 NIFW – TTH300-L2H
Zone 2, Ex nA IIC T6...T4 Gc
Zone 2 Ex ec IIC T6...T4 Gc
-50°C ≤ Ta ≤ 85°C;

Description of Equipment:

a = Blank or N
b = L1, L2, R1 or R2
c = Extended ambient, blank or SE
d = manufacturer specific extensions which are not relevant to safety.

Specific Conditions of Use:

1. For Intrinsic Safety and Nonincendive Approvals the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 or T5 for a Maximum Ambient Temperature of 56°C.
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 85°C.

2. The TTH300 shall be mounted into a Class II, rated enclosure that is complaint with ANSI / UL 61010-1.
3. When installed as Ex nA or Ex ec the TTH300;

- shall always be installed in an NRTL Certified enclosure that provides a minimum ingress protection of IP54 in accordance with UL 60079-0 and at least pollution degree 2, as defined in UL 60664-1.
- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage at the supply terminals to the equipment.
- The connecting cables shall be installed in a fixed position and secured against tensile loads.

TTR200-a6Hbc – rail mounted temperature transmitter

Equipment Ratings:

Intrinsically safe for Class I, Division 1, Groups A, B, C, D: T6, T4: Intrinsically safe for Zone 0, AEx ia IIC T6...T4 Ga; Intrinsically safe for Zone 1 with connections to Zone 0, AEx [ia Ga] ib IIC T6...T4; Intrinsically safe for Zone 1 with connections to Zone 20, AEx ib IIC T6...T4 Gb / [AEx ia Da] IIIC hazardous (classified) locations using the entity concept per TR200-L6H; Nonincendive for Class I, Division 2, Groups A, B, C , D, T6, T4 hazardous (classified) locations using the nonincendive field wiring concept per TTR200-L6H; Type of protection "n" for Zone 2, AEx nA IIC T6...T4 Gc hazardous (classified) locations ; Increased safety "ec" for Zone 2, AEx ec IIC T6...T4 Gc hazardous (classified) locations indoor and outdoor locations when using an IP54 NRTL enclosure. Ambient temperature range -50°C ≤ Ta ≤ 85°C

Markings:

I.S. for Class I, Division 1, Groups A, B, C, D: T6, T4: Entity – TTR200-L6H
Zone 0, AEx ia IIC T6...T4 Ga: Entity – TTR200-L6H
Zone 0, AEx [ia Ga] ib IIC T6...T4: Entity – TTR200-L6H
Zone 1, AEx ib IIC T6...T4 Gb / [20] [AEx ia Da] IIIC Entity – TTR200-L6H
Class I, Division 2, Groups A, B, C, D T6, T4: NIFW – TTR200-L6H
Zone 2, AEx nA IIC T6...T4 Gc
Zone 2, AEx ec IIC T6...T4 Gc
50°C ≤ Ta ≤ 85°C;

Description of Equipment:

a = L or R
b = Extended ambient, blank or SE
c = Manufacturer specific extensions – Not relevant to safety

Specific Conditions of Use:

1. For Intrinsic Safety and Nonincendive Approvals the Temperature code and Ambient temperatures are as follows

- T* = Temperature Code T6 or T5 for a Maximum Ambient Temperature of 56°C.
- T* = Temperature Code T4 for a Maximum Ambient Temperature of 85°C.

2. The TTR200 shall be mounted into a Class II, rated enclosure that is complaint with ANSI / UL 61010-1.
3. When installed as AEx nA or AEx ec the TTR200;

- shall always be installed in an NRTL Certified enclosure that provides a minimum ingress protection of IP54 in accordance with UL 60079-0 and at least pollution degree 2, as defined in UL 60664-1.
- Transient protection shall be provided that is set at a level not exceeding 140% of the peak rated voltage at the supply terminals to the equipment.
- The connecting cables shall be installed in a fixed position and secured against tensile loads.

To verify the availability of the Approved product, please refer to www.approvalguide.com

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