FM Approvals
Member of the FM Global Group
FM Approvals
1151 Boston-Providence Turnpike
P.O. Box 9102 Norwood, MA 02062 USA
T: 781 762 4300 F: 781 762 9375 www.fmapprovals.com

CERTIFICATE OF COMPLIANCE

HAZARDOUS LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

Model TTH300-ab, Temperature Transmitter
IS/I,II,III/1/ABCDEFG/ T* ; — SAP_214829; Entity; I/0/AEx ia IIC; T*-SAP_214829;NI/I/2/ABCD/ T*; NI/2/II T*=Ta=*-SAP_214831; S/II,III/2/EFG T*.
Entity Parameters:
Vmax=30v, Imax= 130mA, Pmax= 0.8W Ci=5nF, Li=500µH

Output Terminals(1,2,3,4,5 and 6)
Group AB Voc=6.5v, Isc= 25.0mA, Po= 38mW Ca=1.55µF, La=5mH
Group CD Voc=6.5v, Isc= 25.0mA, Po= 38mW Ca=8.75µF, La=5mH

Output Terminals (JP1)
Voc=6.2v, Isc= 65.2mA, Po= 101mW Ca=1.4µF, La=5mH
NonIncendive Field Wiring parameters
Vmax=30v, Imax= 130mA, Pmax= 0.8W
a = Type of protection; L1 or L2.
b = Communication Protocol; H.

Special Conditions of Use:
1. The Model TTH300 must be used with an IP54 NRTL certified enclosure.
2. For Intrinsic Safety and Non Incendive 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.

Model TTF300-abcd, Temperature Transmitter
IS/I,II,III/1/ABCDEFG/ T* ; — SAP_214832; Entity; I/0/AEx ia IIC; T*-SAP_214832;NI/I/2/ABCD/ T*; NI/2/II T*=Ta=*-SAP_214828; S/II,III/2/EFG T**, XP/I/ABCD/ T*; DIP/II,III/EFG/ T**; Type 4X; IP66, IP67
Entity Parameters:
Vmax=30v, Imax= 130mA, Pmax= 0.8W Ci=5nF, Li=500µH

Output Terminals(1,2,3,4,5 and 6)
Group AB Voc=6.5v, Isc= 25.0mA, Po= 38mW Ca=1.55µF, La=5mH
Group CD Voc=6.5v, Isc= 25.0mA, Po= 38mW Ca=8.75µF, La=5mH

Output Terminals (JP1)
Voc=6.2v, Isc= 65.2mA, Po= 101mW Ca=1.4µF, La=5mH
NonIncendive Field Wiring parameters
Vmax=30v, Imax= 130mA, Pmax= 0.8W
a = Type of protection; L1or L2.
b = Housing/Display; A, B, C, D.
c = Cable Entry; 1,2,3.Certificates CS
d = Communication protocol; H.

Special Conditions of Use:
1. For Intrinsic Safety and Non Incendive Approvals the Temperature code and Ambient temperatures are as follows:
T*=Temperature Code T6 for a Maximum Ambient Temperature of 44°C.
T*=Temperature Code T5 for a Maximum Ambient Temperature of 56°C
T*=Temperature Code T4 for a Maximum Ambient Temperature of 84°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.

Model TTH200-ab, Temperature Transmitter
IS/I,II,III/1/ABCDEFG/ T* ; — TTH200-L1H; Entity; I/0/AEx ia IIC; T*-TTH200-L1H;NI/I/2/ABCD/ T*; NI/2/II T*=Ta=*-TTH200-L2H; S/II,III/2/EFG T*.
Entity Parameters:
Vmax=30v, Imax= 130mA, Pmax= 0.8W Ci=5nF, Li=500µH

Output Terminals(1,2,3,4,5 and 6)
Group AB Voc=6.5v, Isc= 25.0mA, Po= 38mW Ca=1.55µF, La=5mH
Group CD Voc=6.5v, Isc= 25.0mA, Po= 38mW Ca=8.75µF, La=5mH

Output Terminals (JP1)
Voc=6.2v, Isc= 65.2mA, Po= 101mW Ca=1.4µF, La=5mH
NonIncendive Field Wiring parameters
Vmax=30v, Imax= 130mA, Pmax= 0.8W
a = Type of protection; L1 or L2.
b = Communication Protocol; H.

Special Conditions of Use:
1. The Model TTH200 must be used with an IP54 NRTL certified enclosure.
2. For Intrinsic Safety and Non Incendive 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.

Model TTF350-abcdef, Temperature Transmitter
IS/I,II,III/1/ABCDEFG/ T* ; — TTF350-L4; Entity; I/0/AEx ia/IIC; T*-TTF350-L4;NI/I/2/ABCD/ T*; NI/2/II T*=Ta=*-TTF350-L5; S/II,III/2/EFG T**, XP/I/ABCD/ T*; DIP/II,III/EFG/ T**; Type 4X; IP66 IP67.
Entity Parameters:
Vmax=30v, Imax= 130mA, Pmax= 0.8W Ci=5nF, Li=500µH

Output Terminals(1,2,3,4,5 and 6)
Group AB Voc=6.5v, Isc= 25.0mA, Po= 38mW Ca=1.55µF, La=5mH
Group CD Voc=6.5v, Isc= 25.0mA, Po= 38mW Ca=8.75µF, La=5mH

Output Terminals (JP1)
Voc=6.2v, Isc= 65.2mA, Po= 101mW Ca=1.4µF, La=51mH
NonIncendive Field Wiring parameters
Vmax=30v, Imax= 130mA, Pmax= 0.8W

a = Type of protection; L3 or L4 or L5.
b = Housing/Display; N, or R.
c = Cable Entry; 5,6 or 8.
d = Communication protocol; H.

Special Conditions of Use:
1. For Intrinsic Safety and Non Incendive Approvals the Temperature code and Ambient temperatures are as follows:
T*=Temperature Code T6 for a Maximum Ambient Temperature of 44°C.
T*=Temperature Code T5 for a Maximum Ambient Temperature of 56°C
T*=Temperature Code T4 for a Maximum Ambient Temperature of 84°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.

Model TTR200-ab, Temperature Transmitter
IS/I,II,III/1/ABCDEFG/ T* ; — TTR200-L6H(IS); Entity; I/0/AEx ia/IIC; T*- TTR200-L6H(IS) ;NI/I/2/ABCD/ T*; NI/2/II T*=Ta=*-TTR200-L6H(NI).
Entity Parameters:
Vmax=30v, Imax= 130mA, Pmax= 0.8W Ci=5nF, Li=500µH

Sensor Terminals(1,2,3,4,5 and 6)
Group AB Voc=6.5v, Isc= 25.0mA, Po= 38mW Ca=1.55µF, La=5mH
Group CD Voc=6.5v, Isc= 25.0mA, Po= 38mW Ca=8.75µF, La=5mH

Display Connector
Voc=6.2v, Isc= 65.2mA, Po= 101mW Ca=1.4µF, La=5mH
NonIncendive Field Wiring parameters
Vmax=30v, Imax= 130mA, Pmax= 0.8W

a = Type of protection; L6.
b = Communication protocol; H.

Special Conditions of Use:
1. For Intrinsic Safety and Non Incendive 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. For a Class II,III rating the instrument is required to be mounted into an Class II, Class III rated enclosure that is compliant to ANSI/ISA 61010 standard.

Model TTR300-ab, Temperature Transmitter
IS/I,II,III/1/ABCDEFG/ T* ; — TTR300-L6H(IS); Entity; I/0/AEx ia/IIC; T*- TTR300-L6H(IS) ;NI/I/2/ABCD/ T*; NI/2/II T*=Ta=*-TTR300-L6H(NI).
Entity Parameters:
Vmax=30v, Imax= 130mA, Pmax= 0.8W Ci=5nF, Li=500µH

Sensor Terminals(1,2,3,4,5 and 6)

Group AB *Voc=6.5v, Isc= 25.0mA, Po= 38mW Ca=1.55µF, La=5mH*
Group CD *Voc=6.5v, Isc= 25.0mA, Po= 38mW Ca=8.75µF, La=5mH*

Display connector
Voc=6.2v, Isc= 65.2mA, Po= 101mW Ca=1.4µF, La=5mH
NonIncendive Field Wiring parameters
Vmax=30v, Imax= 130mA, Pmax= 0.8W

a = Type of protection; L6.
b = Communication protocol; H.

Special Conditions of Use:
1. For Intrinsic Safety and Non Incendive 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. For a Class II,III rating the instrument is required to be mounted into an Class II, Class III rated enclosure that is compliant to ANSI/ISA 61010 standard.

Equipment Ratings:

The TTF350, TTH300, TTH200, TTF300, TTR200 and TTR300 Series Temperature Transmitters are FM Approved for Intrinsic Safety for Class I, II, III, Division 1, Groups A, B, C, D, E, F and G; Non Incendive for Class I, Division 2, Groups A, B, C, D and Suitable for Class II, III, Division 2, Groups E, and G when connected in conjunction with Control Drawings SAP_214828, SAP_214829, SAP_214830, SAP_214831, SAP_214832, TTH200-L1H, TTH200-L2H, TTF350-L4...H(1), TTF350-L4...H(2), TTF350-L5...H(1), TTF350-L5...H(2), . TTR200-L6H(IS), TTR300-L6H(IS), TTR200-L6H(NI) and TTR300-L6H(NI).

In addition, the TTF300 and TTF350Temperature Transmitter is FM Approved for Explosionproof For Class I, Division 1, Groups A, B, C and D and Dust-Ignition Proof for Class II, III, Division 1, Groups E, F and G Hazardous(classified) Locations Indoors and Outdoors Type 4X, IP66, IP67.

FM Approved for:

ABB Automation Products GmbH
Alzenau, Germany

This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

Class 3600	1998
Class 3610	1999
Class 3611	2004
Class 3615	2006
Class 3616	1989
ISAS12.00.01	2002
Class 3810	2005
Nema 250	2003
IEC60529	2004

Original Project ID: 3027610 Approval Granted: January 5, 2007

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
070801	November 2, 2007		
3028938	December 10, 2007		
3031178	October 9, 2008		

FM Approvals LLC

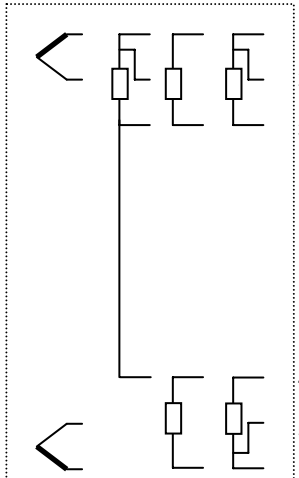
J. E. Marquedant

James E. Marquedant
Group Manager, Electrical

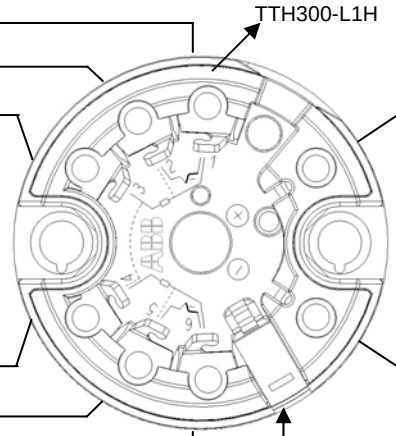
9 October 2008
Date

Hazardous Location

Sensors must be FM approved or be a simple apparatus. Simple apparatus is a device which will neither generate or store more than 1.5 V; 0.1 A; 25 mW or 20 µJ such as switches; RTD's, TC or LED's



Sensor Types Overview
Channel 1 and 2
RTD or TC or Voltage or …



HMI / Display – Interface
(Protection Cover,
open with screw before connect !)

Apparatus Input Values
I. S. V max ≦ 30.0 V DC ;
I max ≦ 130 mA ; Pi ≦ 0.8W
Ci = 5nF Li = 0,5mH

Non – Hazardous Location

Barrier
Galvanic Isolator

< 250 V

" 2 wire hookup"

I.S. Sensor Field Circuit Entity Parameters
Voc = 6.5 V; Isc < 25.0 mA; Po = 38 mW
Tem. Ident. for Class I Div. 1 and Div. 2; Groups A,B,C,D
T6 at Tamb = 56 °C; T5 at Tamb = 71 °C;
T4 at Tamb = 85 °C
Tem. Ident. For Class I Zone 0 AEx ia IIC
T6 at Tamb = 44 °C; T5 at Tamb = 56 °C;
T4 at Tamb = 84 °C
Terminals: 1,2,3,4,5,6
GP: A,B Ca = 1.55 µF; La = 5.0 mH
C,D Ca = 8.75 µF; La = 5.0 mH

HMI / Display Interface
Intrinsically Safe Output Parameters
Voc = 6.2 V; Isc < 65.2 mA; Po = 101 mW
Class I Div 1 and Div 2; ; Groups: A,B,C,D or
Class I Zone 0 AEx ia IIC
Terminals: 6 PIN Connector
GP A,B Ca = 1.4 µF; La = 5.0 mH
C,D Ca = 8.9 µF; La = 5.0 mH

1. Barrier or Galvanic Isolator must be FM approved and must be installed in accordance with manufactures instructions.
2. Barrier or Galvanic Isolator parameters must meet the following Requirements :
3. Voc or Vt ≦ V max; Ca ≧ Ci + Ccable;
   Isc or It ≦ I max; La ≧ Li + Lcable
   Po or Pt ≦ P max
1. Maximum non hazardous area voltage must not exceed 250V
2. Install in accordance with the NEC (ANSI/NFPA 70) and ANSI/ISA RP12.6. " Installation of intrinsically safe systems" Do not alter without FM authorization

Temperature Transmitter Model "TTH300" Ordering Code "TTH300-L1H" is an open type Unit which must be installed within an enclosure appropriate for environmental protection accordance with ANSI/ISA S82 01 and S82 03 standards.

Warning: Resistance between barrier ground and earth ground must be less then 1.0 Ohm!

Rev.	Desc.	Date	Name
1.03	HART	17.07.07	Zeiger
1.02	FM Report	05.10.06	Zeiger
1.01	FM input	10.07.06	Zeiger
1.00	Release	23.05.06	Zeiger

	Date	Name
Approv.	17.07.07	Müller

ABB
Automation Products

Title: TTH300 HART
I.S. Temperature Transmitter
Control Drawing

Scale: -----

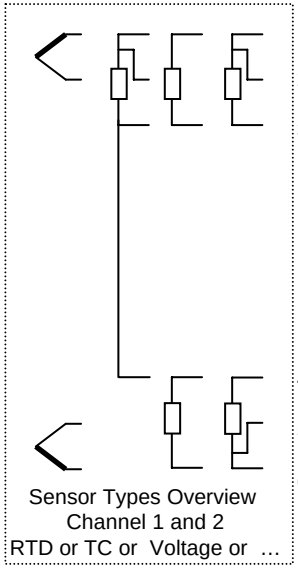
Drawing / Part No.: SAP_214829

Page : of 1 / 1

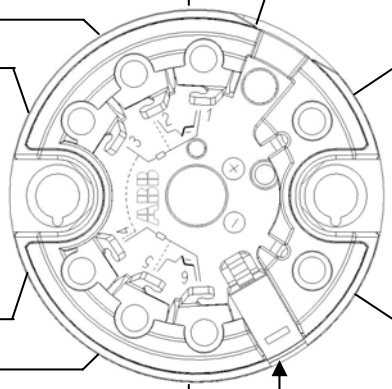
Replacement of: --------

Hazardous Location

The sensor must be FM approved or be a simple apparatus. Simple apparatus is a device which will neither generate or store more than 1.5 V; 0.1 A; 25 mW or 20 µJ such as switches; RTD's, TC or LED's



Sensor Types Overview
Channel 1 and 2
RTD or TC or Voltage or …



HMI / Display – Interface
(Protection Cover,
open with screw before connect !)

Apparatus Input Values

N.I. V max ≦ 30.0 V ; I max ≦ 130 mA ;
Pi ≦ 0,8 W ; Ci = 5nF; Li =0,5mH

Non – Hazardous Location

Associated Apparatus

< 250 V

" 2 wire hookup –
Nonincendive Field Circuit"

FM nonincendive field circuit approval
Temp.Ident:T6 at Tamb = 56 °C;
T5 at Tamb = 71 °C;
T4 at Tamb = 85 °C;
Cass I Div 2; Groups: A,B,C,D or
Cass 1 Zone 2 Group IIC T6

Sensor Field Circuit Entity Parameters
Voc = 6.5 V; Isc < 25.0 mA; Po = 38 mW
Terminals: 1,2,3,4,5,6
GP: A,B = Ca =1.55 µF; La = 5.0 mH
C,D = Ca = 8.75 µF; La = 5.0 mH

Temperature Transmitter Model "TTH300"
Ordering Code "TTH300-L2H" is an open type unit which must be installed within an enclosure appropriate for environmental protection accordance with ANSI/ISA S82 01 and S82 03 standards.

HMI / Display Interface Output Parameters
N.I. Cass I Div 2; Group: A,B,C,D or
N.I. Class 1 Zone 2 Groups IIC T6
Voc = 6.2 V; Isc < 65.2 mA; Po = 101 mW
Terminals: 6 PIN Connector
GP A,B Ca = 1.4 µF; La = 5.0 mH
C,D Ca = 8.9 µF; La = 5.0 mH

Associated Apparatus
Nonincendive Parameters must meet the following Requirements :
Voc or Vt ≦ V max; Ca ≧ Ci + Ccable;
Isc or It ≦ I max; La ≧ Li + Lcable
The temperature transmitter is FM approved for nonincendive field ciruits when installed per national electrical code (NEC) article 501-4(B) exception or 502-4(B) exception with FM approved nonincendive field circuit output apparatus which meet the parameters indicated below.
Article 501-4(B)/502-4(B)

Exception: Wiring in nonincendive circuits shall be permitted using any of the methods suitable for wiring in ordinary locations !

Rev.	Desc.	Date	Name
1.03	HART	17.07.07	Zeiger
1.02	FM Report	05.10.06	Zeiger
1.01	FM Input	10.07.06	Zeiger
1.00	Release	23.05.06	Zeiger

Approv.	17.07.07	Müller
	Date	Name

ABB
Automation Products

Title:
TTH300 HART
N. I. Temperature Transmitter
Control Drawing

Scale: -----

Drawing / Part No.:
SAP_214831

Page : of 1 / 1

Replacement of: --------