STT17F

STT3000 Smart Temperature Transmitter

Operator Manual

Doc. No.: 34-ST-25-28

Revision Date: 2/06

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About This Document

Abstract

This document is intended to support the installation and operation of the Model STT17F Foundation™ Fieldbus Smart Temperature Transmitter.

Revision Notes

The following list provides notes concerning all revisions of this document.

Rev. ID	Date	Notes
0	2/06	This document is the initial Honeywell release of the STT17F Transmitter

Contacts

World Wide Web

The following lists Honeywell's World Wide Web sites that will be of interest to our customers.

Honeywell Organization	WWW Address (URL)
Corporate	*http://www.honeywell.com*
Industrial Measurement and Control	*http://www.honeywell.com/imc*

Telephone

Contact us by telephone at the numbers listed below.

	Organization	Phone Number	
United States and Canada	Honeywell	1-800-423-9883	Tech. Support
		1-888-423-9883	Q&A Faxback (TACFACS)
		1-800-525-7439	Service

Notices

Safety Instructions

Ex installation:

For safe installation of STT17F in a hazardous area, the following must be observed. The module must only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

Year of manufacture can be taken from the first two digits in the serial number.

For Ex data see section 1.8 Ex data.

The sensor circuit is not infallibly galvanically isolated from the input circuit. However, the galvanic isolation between the circuits is capable of withstanding a test voltage of 500 Vac during 1 minute.

The transmitter must be mounted in an enclosure in order to provide a degree of ingress protection of at least IP20.

In explosive atmospheres caused by air / dust mixtures:

The transmitter may only be installed in a potentially explosive atmosphere caused by the presence of combustible dust when mounted in a metal enclosure form B according to DIN 43729 that is providing a degree of ingress protection of at least IP 6X in accordance with EN 60529, that is suitable for the application and is correctly installed.

Cable entries and blanking elements shall be used that are suitable for the application and correctly installed.

For an ambient temperature ≥60°C, heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

Special Conditions for Safe Use - STT17F-BN:

The transmitter shall be mounted in an enclosure providing a degree of ingress protection of at least IP54 in accordance with EN 60529.

Provisions must be made to prevent the rated supply voltage being exceeded by more than 40%.

Special Conditions for Safe Use - STT17F-BS:

If the enclosure in which the transmitter is mounted is made of aluminium and installed in Zone 0, 1 or Zone 20, 21 or 22 it shall not contain by weight more than 6% in total of magnesium and titanium.

The additional enclosure of the apparatus shall be designed and/or installed in such a way that, even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded.

Consigne de sécurité

Installation S.I. :

Pour l'installation de STT17F dans les zones dangereuses, conformez-vous aux consignes de sécurité suivantes : l'installation ne doit être réalisée que par du personnel qualifié connaissant la législation nationale et internationale ainsi que les directives et standards régissant ce domaine.

L'année de production ressort des deux premiers chiffres du numéro de série.

Pour les données de sécurité intrinsèque, voir section 2.8 Caractéristiques S.I.

L'isolation galvanique entre le circuit du capteur et le circuit d'entrée n'est pas infaillible. Cependant, l'isolation galvanique entre les circuits est capable de résister à une tension de test de 500 Vca pendant 1 minute.

Le transmetteur doit être monté dans un boîtier assurant un degré d'étanchéité d'au moins IP20.

Dans les atmosphères explosibles dues à des mélanges d'air avec des poussières :

Le transmetteur doit seulement être installé dans les atmosphères potentiellement explosibles dû à la présence de poussières combustibles quand il est monté dans un boîtier métallique DIN B conformément à DIN 43729 assurant un degré d'étanchéité d'au moins IP 6X conformément à l'EN 60529. Ce boîtier doit convenir à l'application et il doit être correctement installé.

Seulement des raccords de câble et des bouchons convenant à l'application et correctement installés doivent être utilisés.

Pour une température ambiante ≥60°C, il faut utiliser des câbles résistant aux températures élevées avec une capacité nominale d'au moins 20 K au dessus de la température ambiante.

Conditions spécifiques à l'utilisation sûre - STT17F-BN :

Le transmetteur doit être installé dans un boîtier de protection assurant un degré d'étanchéité d'au moins IP 54 conformément à l'EN 60529.

Il faut prendre des mesures pour éviter que la tension d'alimentation nominelle soit dépassée par plus de 40%.

Conditions spécifiques à l'utilisation sûre - STT17F-BS :

Si le boîtier dans lequel est monté le transmetteur est fait d'aluminium et installé en zone 0, 1 ou zone 20, 21 ou 22, il ne doit contenir en poids plus que 6% en total de magnésium et de titane.

Le boîtier supplémentaire de l'appareil doit être construit et/ou installé dans une telle manière que, même dans le cas d'incidents rares, les sources d'inflammation dûes aux impacts et aux étincelles de friction ne peuvent se produire.

Sicherheitsinstruktion

Ex-Installation:

Für sichere Installation von STT17F in explosionsgefährdeter Umgebung muss folgendes beobachtet werden. Die Installation muss nur von qualifizierten Personen, die mit den nationalen und internationalen Gesetze, Direktiven und Standards des Gebiets bekannt sind, vorgenommen werden.

Die ersten beiden Ziffern der Seriennummer geben das Produktionsjahr an.

Für Ex-Daten siehe Abschnitt 3.8 Ex-Daten.

Die galvnische Trennung zwischen dem Sensorkreis und dem Eingangskreis ist nicht unfehlbar. Allerdings ist die galvanische Trennung zwischen den Kreisen so ausgelegt, dass diese eine Testspannung von 500 Vac für eine Minute aushält.

Der Messumformer muss in einem Gehäuse montiert werden, um die Mindestanforderung des Berührungsschutzes mit dem Schutzgrad IP 20 zu erreichen.

In Explosionsfähige Atmosphären durch Staub/Luft-Gemische:

Der Messumformer darf nur in einer potentiellen explosiven Atmosphäre, basierend auf entflammbaren Staub, eingesetzt werden, wenn er in einem Metallkopf Form B gemäß DIN 43729 montiert ist, welcher einen Schutzgrad von mindestens IP 6X gemäß EN 60529 besitzt und für den dementsprechenden Einsatz zugelassen ist.

Es dürfen nur Kabeleinführungen und Abdeckungen eingesetzt werden, welche für die jeweilige Anwendung zugelassen sind.

Bei einer Umgebungstemperatur ≥60°C müssen hitzebeständige Leitungen eingesetzt werden, welche für eine mindestens 20 K höhere Umgebungstemperatur zugelassen sind.

Sonderbedingungen für sichere Anwendung - STT17F-BN:

Der Messumformer muss in einem Gehäuse, welcher einen Schutzgrad von mindestens IP 54 gemäß EN 60529 besitzt, eingebaut werden.

Es müssen Maßnahmen getroffen werden, dass die Versorgungsspannung nicht höher als 40% über die Bemessungsspannung steigt.

Sonderbedingungen für sichere Anwendung - STT17F-BS:

Wenn das Gehäuse, in dem der Messumformer montiert ist, aus Aluminium gemacht ist und es in Zone 0, 1 oder Zone 20, 21 oder 22 installiert ist, es muss höchstens eine Totale von 6% Magnesium und Titanium einhalten.

Das zusätzliche Gehäuse des Apparats ist so zu konstruieren und herzustellen, dass Zündquellen (Stöße und Reibungsfunken) selbst bei selten auftretenden Gerätestörungen vermieden werden.

CONTENTS

FIGURES

1 FOUNDATION™ FIELDBUS TRANSMITTER MODEL STT17F

1.1 Features

- FOUNDATION™ Fieldbus ver.ITK 4.6
- FISCO-certified
- Basic capability with F.F.

1.2 Application

- Linearised temperature measurement with RTD or TC sensor.
- Difference, average or redundancy temperature measurement with RTD or TC sensor.
- Linear resistance, potentiometer and bipolar mV measurements.

1.3 Technical Characteristics

- Bus transmitter with FOUNDATION™ Fieldbus communication.
- Set-up for FOUNDATION™ Fieldbus via Honeywell Experion, Emerson DeltaV, Yokogawa CS 1000 / CS 3000, and ABB Melody / Harmony software.
- The simulation mode function can be activated by way of a magnet.
- Polarity-independent bus connection.
- 24 bit A/D converter ensures high resolution.
- FOUNDATION™ Fieldbus function blocks: 2 analogue and 1 PID.
- FOUNDATION™ Fieldbus capability: Basic.

1.4 Installation

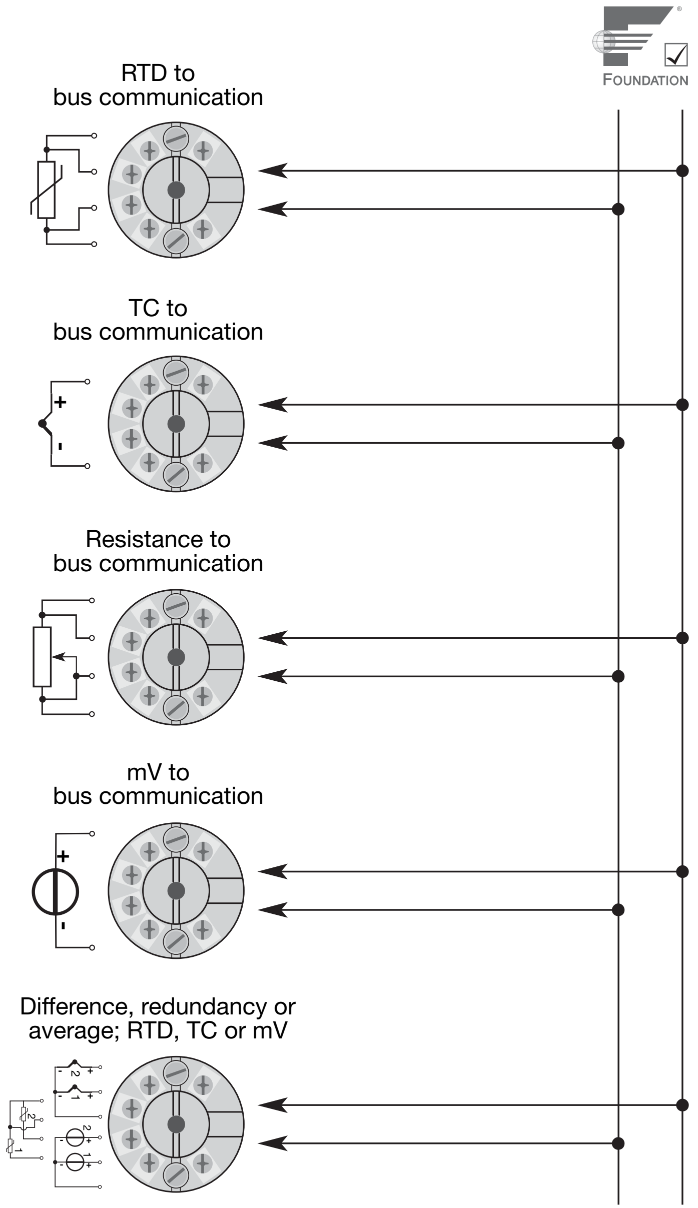


Figure 1-1 2-wire installation

1.5 Electrical Connections

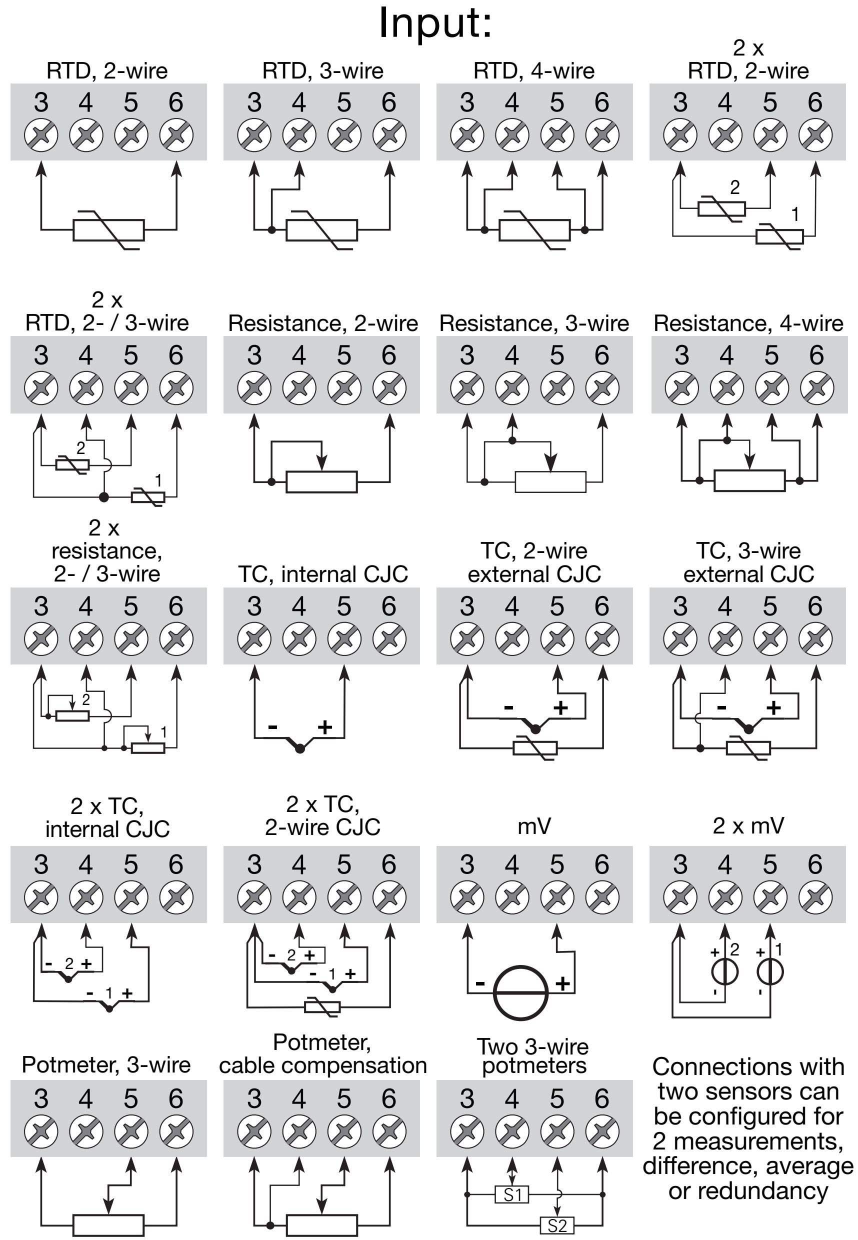


Figure 1-2 Electrical Connections - Input

Electrical Connections, continued

Output:

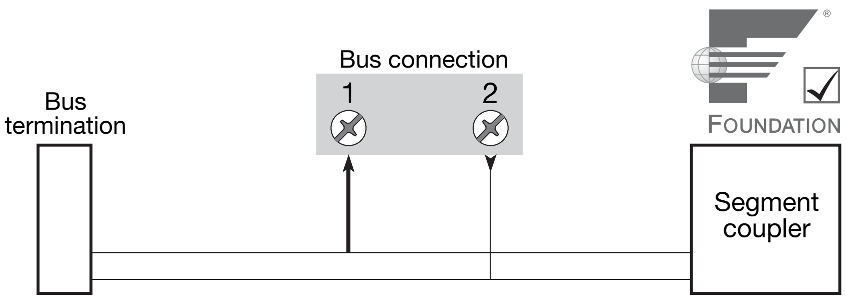


Figure 1-3 Electrical Connections - Output

1.6 Block Diagram

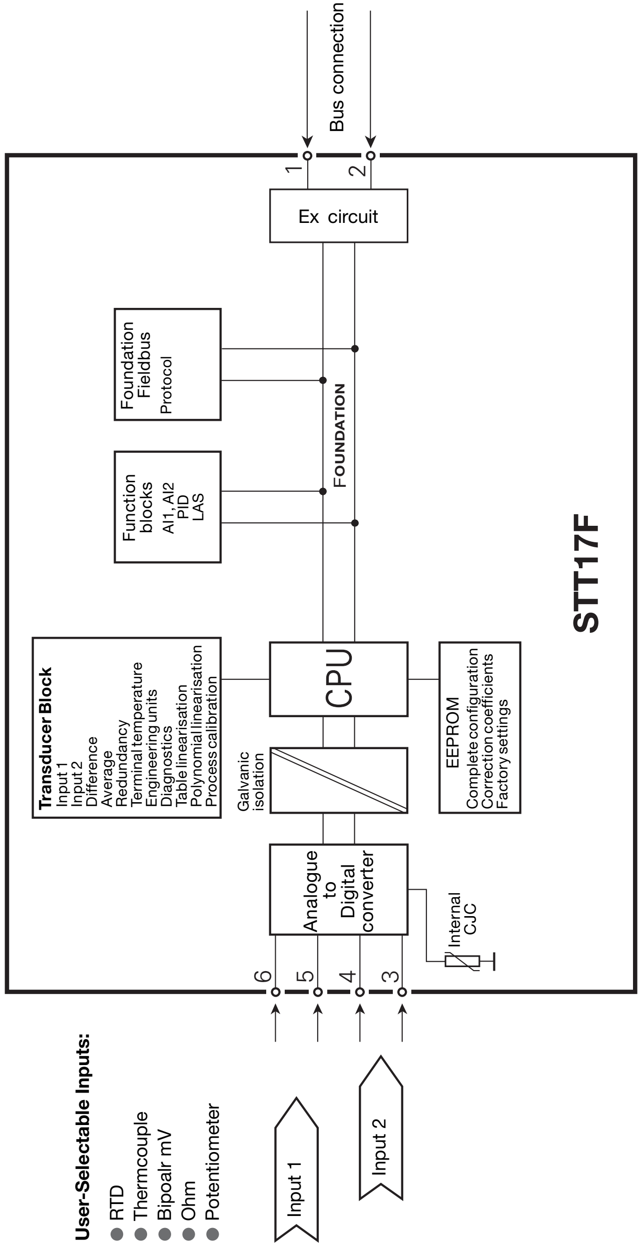


Figure 1-4 Block Diagram

1.7 Bus Installation

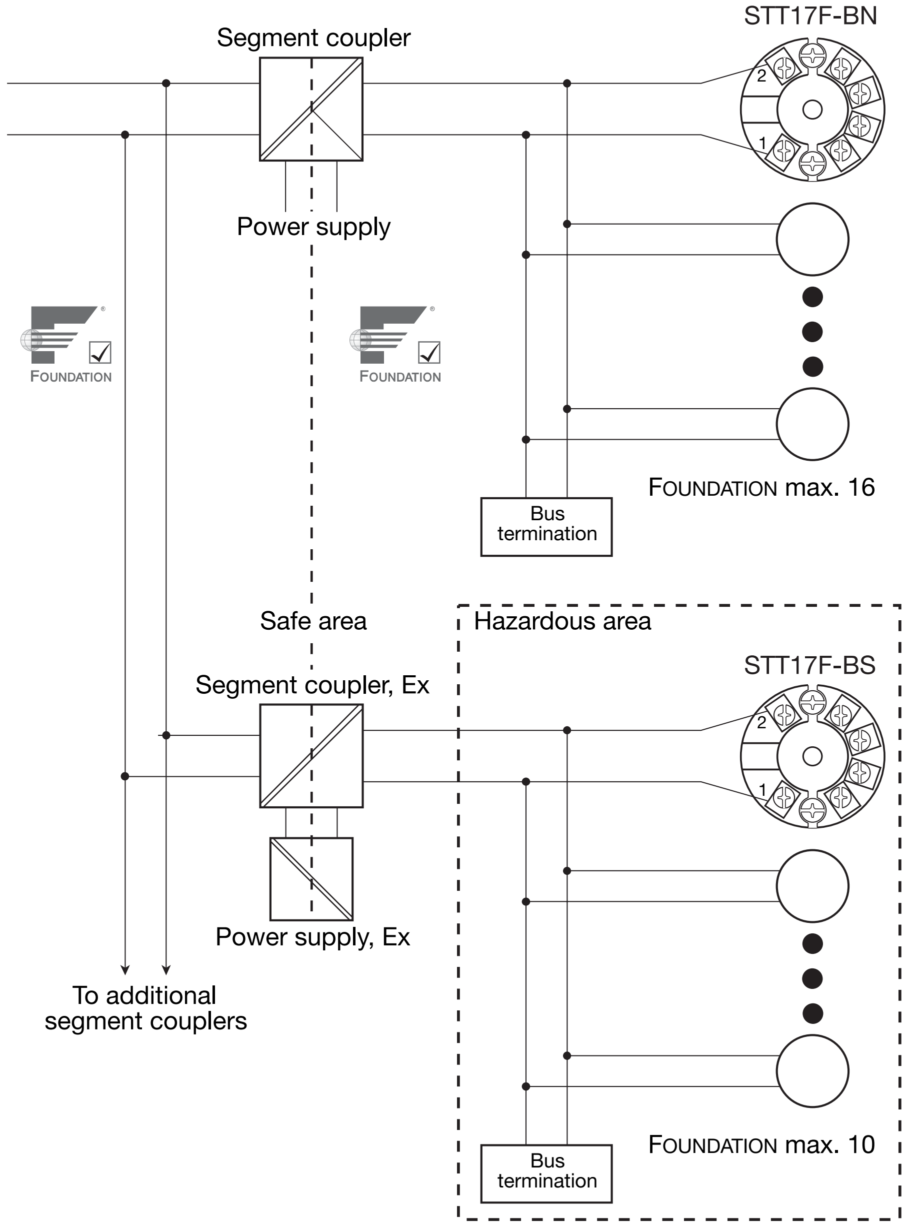


Figure 1-5 Bus Installation

1.8 Ex Data

EEx / I.S. approval STT17F-BN:

KEMA 06ATEX0045 X.................... Ex II 3 G
EEx nA [nL] II C T4...T6

Ex / I.S. data:

Signal output / supply, terminal 1 to 2:

Unit	STT17F-BN
	Zone 2, EEx nA [nL] IIC
	Division 2, nonincendive
	No barrier
U_i	32 VDC
T1...T4	$T_{amb.} < 85°C$
T5	$T_{amb.} < 75°C$
T6	$T_{amb.} < 60°C$

Sensor input, terminal 3, 4, 5 and 6:

U_o..: 5.7 VDC
I_o..: 8.4 mA
P_o..: 12 mW
L_o..: 200 mH
C_o..: 40 µF

EEx / I.S. approval STT17F-BS:

KEMA 06ATEX0046 X.................... Ex II 1 GD or Ex II 2 (1) GD,
T65°C...T105°C
EEx ia IIC or
EEx ib [ia] IIC T4...T6

Applicable in zone .... 0, 1, 2, 20, 21 or 22

Ex / I.S. data:
Signal output / supply, terminal 1 to 2:
Max. ambient temperature depends on the P_O of the connected barrier.

Unit	STT17F-BS Class I, Zone 0, EEx ia IIC, Entity / Fisco IS, Class I, Division 1, Group A, B, C, D Entity / Fisco			
	Barrier where P_O < 0.84 W	Barrier where P_O < 1.3 W	Suitable for FISCO systems	Suitable for FISCO systems
U_i	30 VDC	30 VDC	17.5 VDC	15 VDC
I_i	120 mADC	300 mADC	250 mADC	900 mA
P_i	0.84 W	1.3 W	2,0 W	5.32 W
L_i	1 µH	1 µH	1 µH	1 µH
C_i	2.0 nF	2.0 nF	2.0 nF	2.0 nF
T1...T4	$T_{amb.}$ < 85°C	$T_{amb.}$ < 75°C	$T_{amb.}$ < 85°C	$T_{amb.}$ < 85°C
T5	$T_{amb.}$ < 70°C	$T_{amb.}$ < 65°C	$T_{amb.}$ < 60°C	$T_{amb.}$ < 60°C
T6	$T_{amb.}$ < 60°C	$T_{amb.}$ < 45°C	$T_{amb.}$ < 45°C	$T_{amb.}$ < 45°C

Unit	STT17F-BS Class I, Zone 1, EEx ib IIC, Entity / Fisco IS, Class I, Division 2, Group A, B, C, D Entity / Fisco	
	Barriere where Po < 5.32 W	FISCO segment coupler
U_i	30 VDC	17.5 VDC
I_i	250 mADC	All
P_i	5.32 W	All
L_i	1 µH	1 µH
C_i	2.0 nF	2.0 nF
T1...T4	$T_{amb.}$ < 85°C	$T_{amb.}$ < 85°C
T5	$T_{amb.}$ < 75°C	$T_{amb.}$ < 75°C
T6	$T_{amb.}$ < 60°C	$T_{amb.}$ < 60°C

Sensor input, terminal 3, 4, 5 and 6:
U_O ....: 5.7 VDC
I_O ....: 8.4 mA
P_O ....: 12 mW
L_O ....: 200 mH
C_O ....: 40 µF

2. TRANSMETTEUR FIELDBUS FOUNDATION™ STT17F

2.1 Caractères

- Fieldbus FOUNDATION™ ver. ITK 4.6
- Certifié aux normes FISCO
- Fonctionnalité Basic en Fieldbus Foundation™

2.2 Application

- Mesure linéarisée de la température avec sonde résistive ou thermocouple.
- Mesure de la température différentielle, moyenne ou redondance avec sonde résistive ou thermocouple.
- Résistance linéaire, potentiomètre et mesure de tension bipolaire (mV).

2.3 Caractéristiques techniques

- Transmetteur de bus avec communication Fieldbus FOUNDATION™.
- Configuration Fieldbus FOUNDATION™ avec les logiciels Honeywell Experion, Emerson DeltaV, Yokogawa CS 1000 / CS 3000 et ABB Melody / Harmony.
- Le mode de simulation peut être activé à l'aide d'un aimant.
- La connexion du bus est indépendante de la polarité.
- Le convertisseur A/D de 24 bit assure une très haute résolution du signal.
- Blocs de fonctions Fieldbus FOUNDATION™ : 2 blocs analogiques et 1 bloc PID.
- Fonctionnalités en Fieldbus FOUNDATION™ : Basic.

2.4 Installation

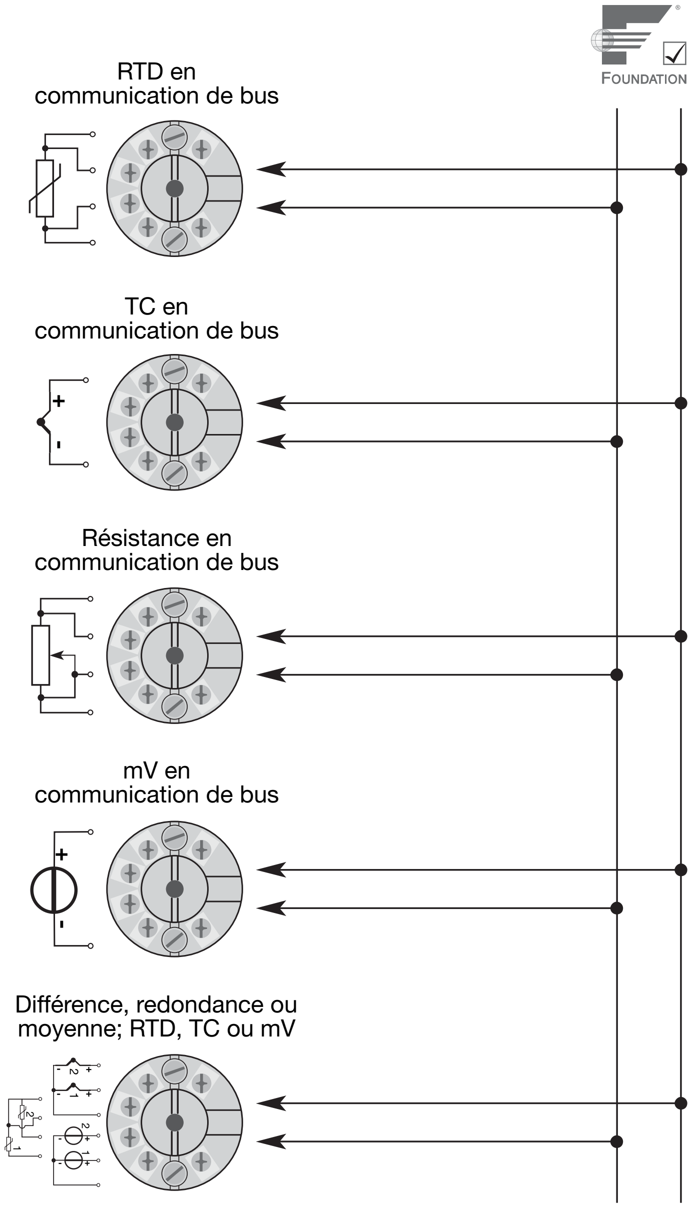


Figure 2-1 Installation

2.5 Connexions

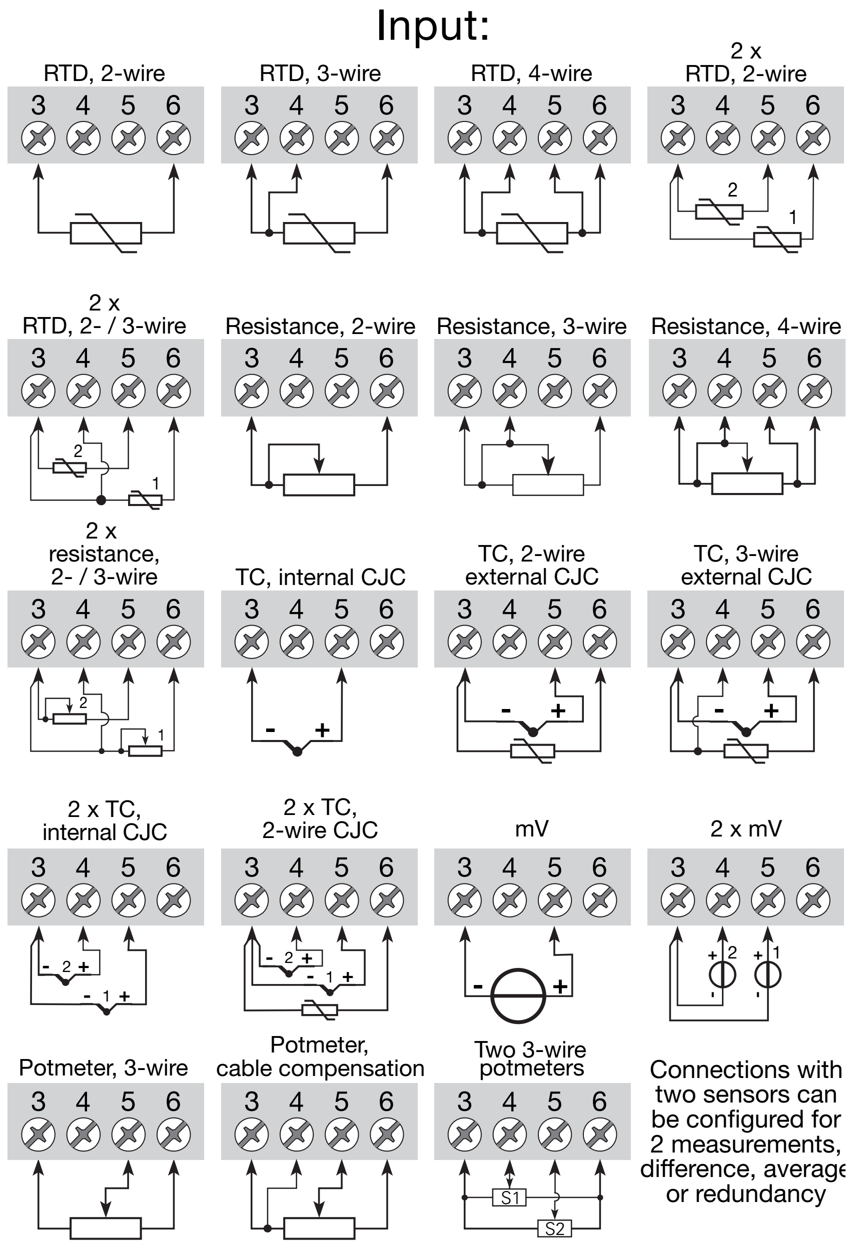


Figure 2-2 Connexions - Entrée

Connexions, continue

Sortie :

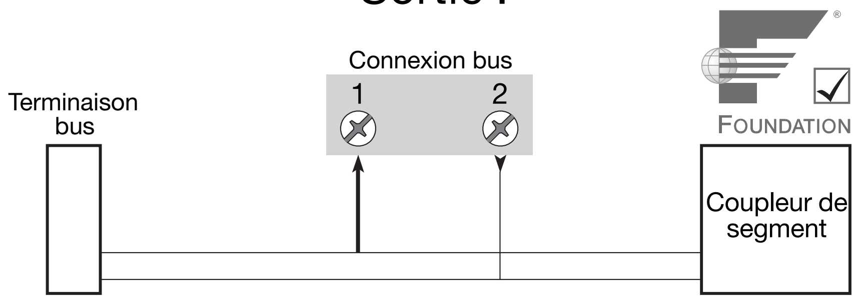


Figure 2-3 Connexions - Sortie

2.6 Schema de Principe

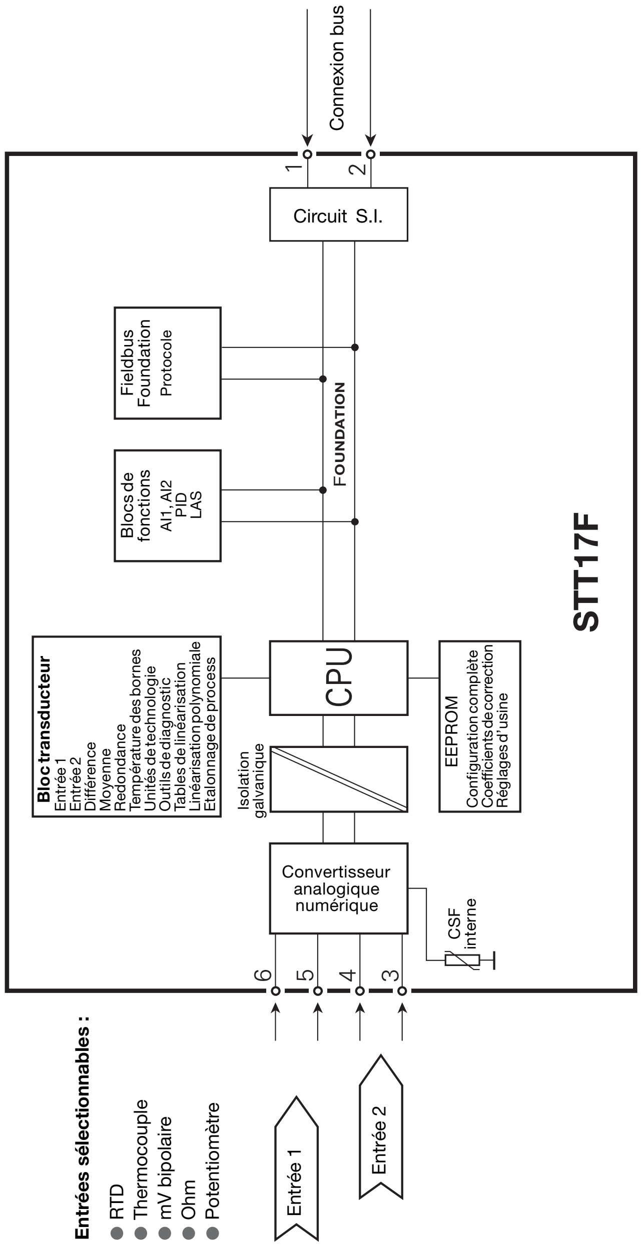


Figure 2-4 Schema de Principe

2.7 Installation bus

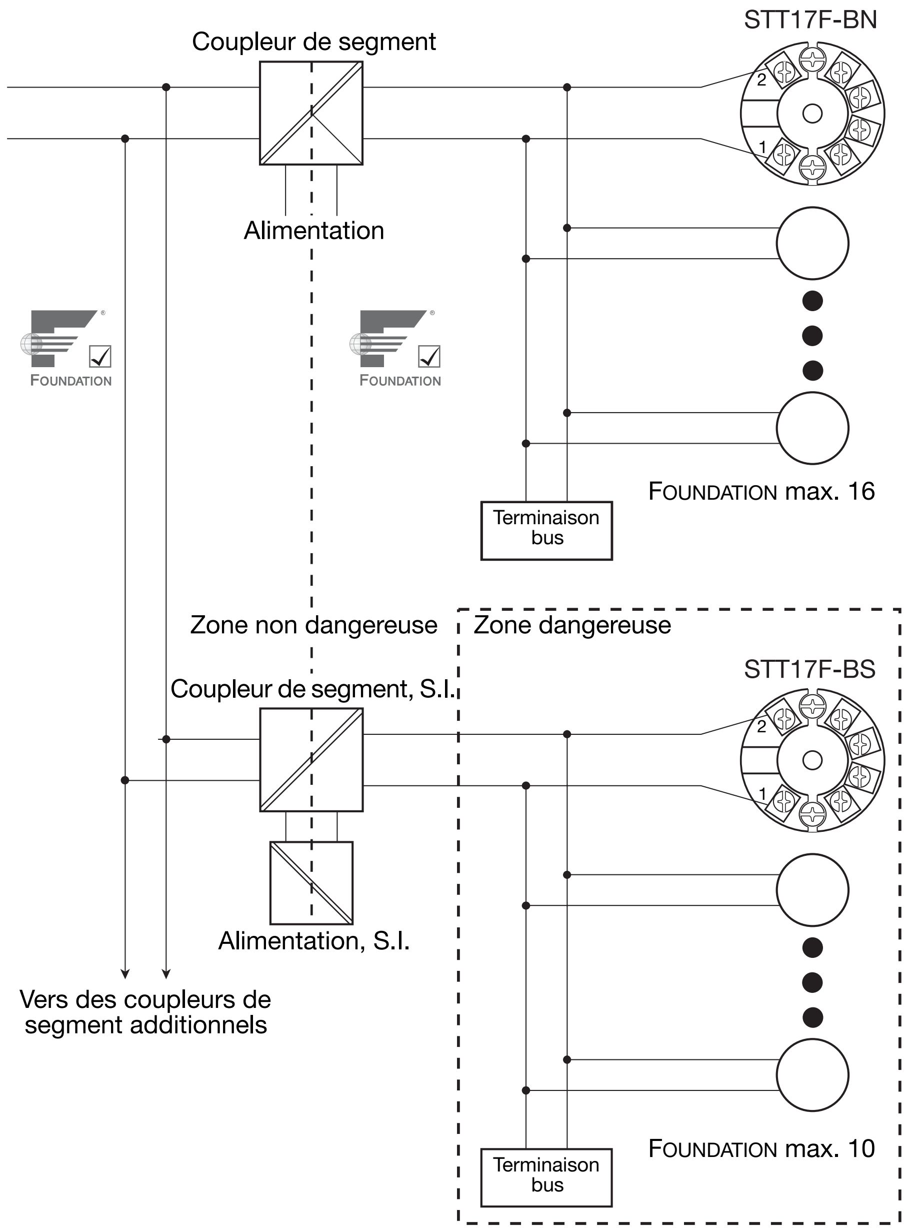


Figure 2-5 Installation bus

2.8. Caractéristiques S.I.

Approbation EEx / I.S. - STT17F-BN :

KEMA 06ATEX0045 X.................... Ex II 3 G
EEx nA [nL] II C T4...T6

Spécifications S.I. :

Unité	STT17F-BN
	Zone 2, EEx nA [L] IIC
	Division 2, non incendiaire
	Pas de barrière
U_i T1...T4 T5 T6	32 Vcc $T_{amb.}$ < 85°C $T_{amb.}$ < 75°C $T_{amb.}$ < 60°C

Entrée sonde, bornes 3, 4, 5 et 6:
U_o...: 5,7 Vcc
I_o...: 8,4 mA
P_o...: 12 mW
L_o...: 200 mH
C_o...: 40 µF

Approbation EEx / I.S. - STT17F-BS :

KEMA 06ATEX0046 X.................... Ex II 1 GD ou Ex II 2 (1) GD
T65°C...T105°C
EEx ia IIC ou
EEx ib [ia] IIC T4...T6
Applicable en zone........................ 0, 1, 2, 20, 21 ou 22

Spécifications S.I. :
Sortie de signal / alimentation, borne 1 à 2:
La température ambiante max. dépend de la valeur P_O de la barrière connectée.

Unité	STT17F-BS			
	Class I, Zone 0, EEx ia IIC, Entity / Fisco			
	IS, Class I, Division 1, Group A, B, C, D Entity / Fisco			
	Barrière où P_O < 0,84 W	Barrière où P_O < 1,3 W	Peut être utilisé en systèmes FISCO	Peut être utilisé en systèmes FISCO
U_i	30 Vcc	30 Vcc	17,5 Vcc	15 Vcc
I_i	120 mAcc	300 mAcc	250 mAcc	900 mA
P_i	0,84 W	1,3 W	2,0 W	5,32 W
L_i	1 µH	1 µH	1 µH	1 µH
C_i	2,0 nF	2,0 nF	2,0 nF	2,0 nF
T1...T4	$T_{amb.}$ < 85°C	$T_{amb.}$ < 75°C	$T_{amb.}$ < 85°C	$T_{amb.}$ < 85°C
T5	$T_{amb.}$ < 70°C	$T_{amb.}$ < 65°C	$T_{amb.}$ < 60°C	$T_{amb.}$ < 60°C
T6	$T_{amb.}$ < 60°C	$T_{amb.}$ < 45°C	$T_{amb.}$ < 45°C	$T_{amb.}$ < 45°C

Unité	STT17F-BS	
	Class I, Zone 1, EEx ib IIC, Entity / Fisco	
	IS, Class I, Division 2, Group A, B, C, D Entity / Fisco	
	Barrière où Po < 5,32 W	Coupleur de segment FISCO
U_i	30 Vcc	17,5 Vcc
I_i	250 mAcc	Toutes
P_i	5,32 W	Toutes
L_i	1 µH	1 µH
C_i	2,0 nF	2,0 nF
T1...T4	$T_{amb.}$ < 85°C	$T_{amb.}$ < 85°C
T5	$T_{amb.}$ < 75°C	$T_{amb.}$ < 75°C
T6	$T_{amb.}$ < 60°C	$T_{amb.}$ < 60°C

Entrée sonde, bornes 3, 4, 5 et 6:
U_O ....: 5,7 Vcc
I_O ....: 8,4 mA
P_O ....: 12 mW
L_O ....: 200 mH
C_O ....: 40 µF

3. FOUNDATION™ FIELDBUS MESSUMFORMER STT17F

3.1 Das Unterscheidungsmerkmal

- FOUNDATION™ Fieldbus Version ITK 4.6
- FISCO-zertifiziert
- F.F. mit Basic-Funktionalität

3.2 Anwendungen

- Linearisierte Temperaturmessungen mit Widerstandsthermometer oder Thermoelement.
- Differenz-, Mittelwert- oder redundante Temperaturmessungen mit Widerstandsthermometer oder Thermoelement.
- Lineare Widerstands-, Kompensator- und bipolare mV-Messungen.

3.3 Technische Merkmale

- Bus-Messumformer mit FOUNDATION™ Fieldbus-Kommunikation.
- Konfiguration über FOUNDATION™ Fieldbus mit Honeywell Experion, Emerson DeltaV, Yokogawa CS 1000 / CS 3000 und ABB Melody / Harmony Software.
- Der Simulationsmodus kann mittels eines Magneten aktiviert werden.
- Polaritätsunabhängige Busanschluss.
- Der 24 Bit A/D-Wandler garantiert eine hohe Auflösung.
- FOUNDATION™ Fieldbus Funktionsblöcke: 2 Analoge und 1 PID.
- FOUNDATION™ Fieldbus Funktionalität: Basic.

3.4 Installation

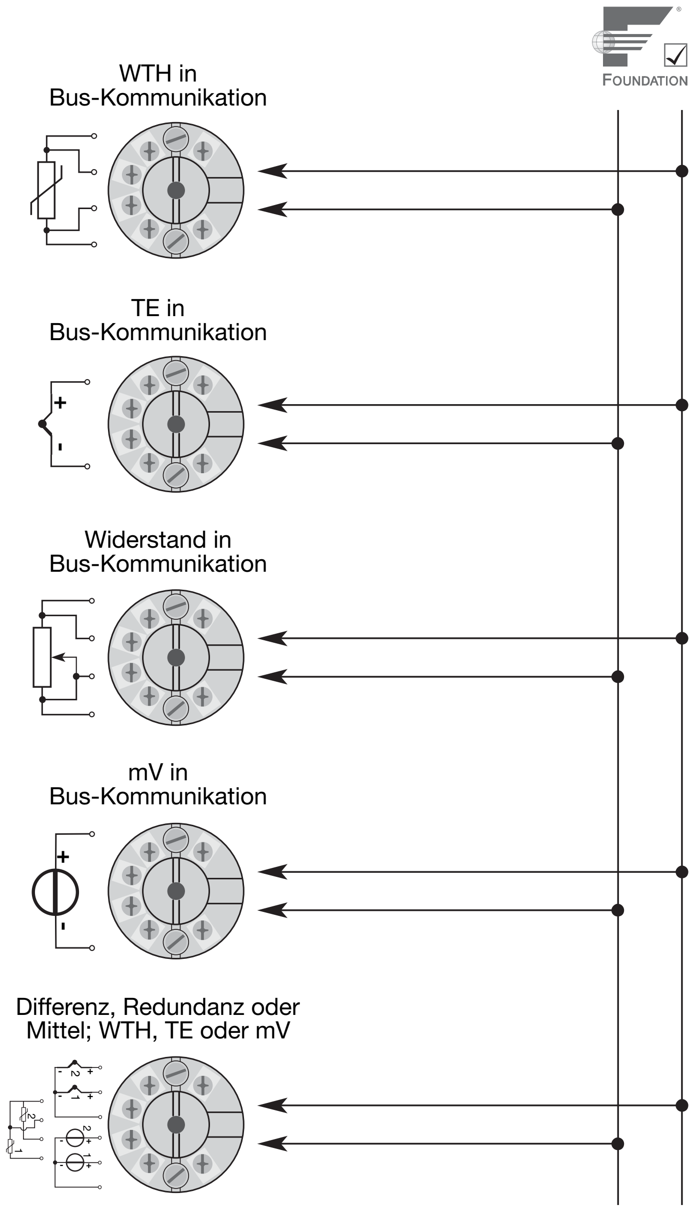


Figure 3-1 2-Draht-Installation

3.5 Anschlüsse

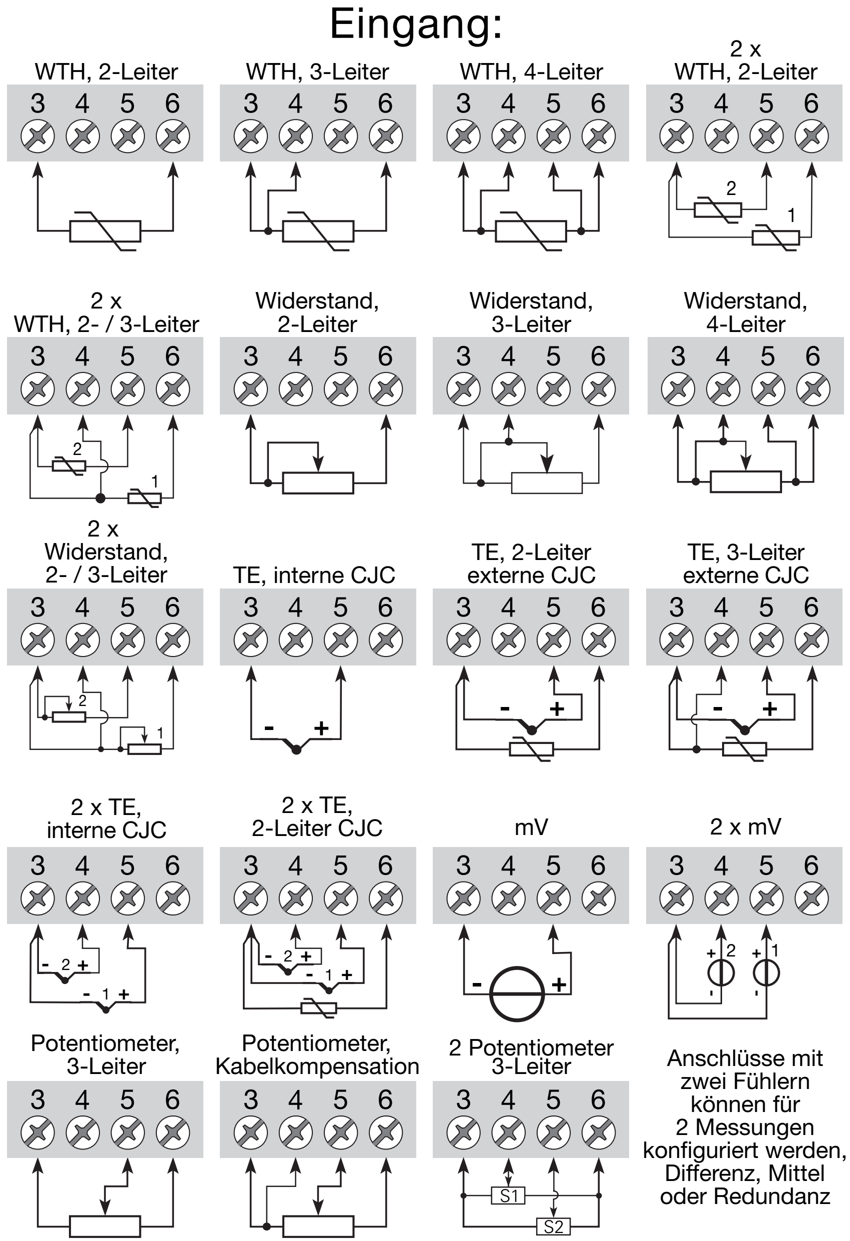


Figure 3-2 Anschlüsse - Eingang

Anschlüsse, Ausgang

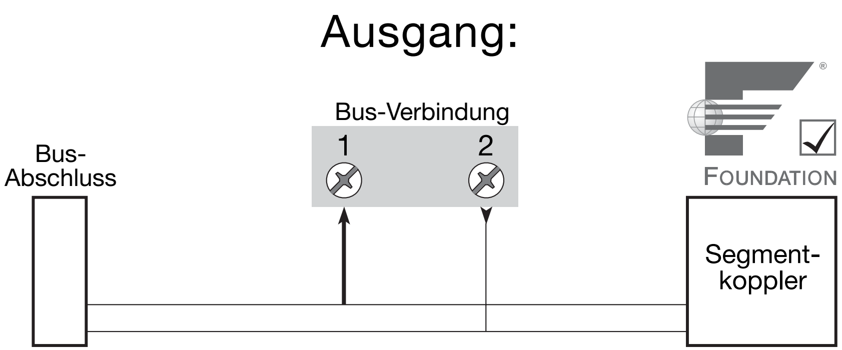


Figure 3-3 Anschlüsse - Ausgang

3.6 Blockdiagramm

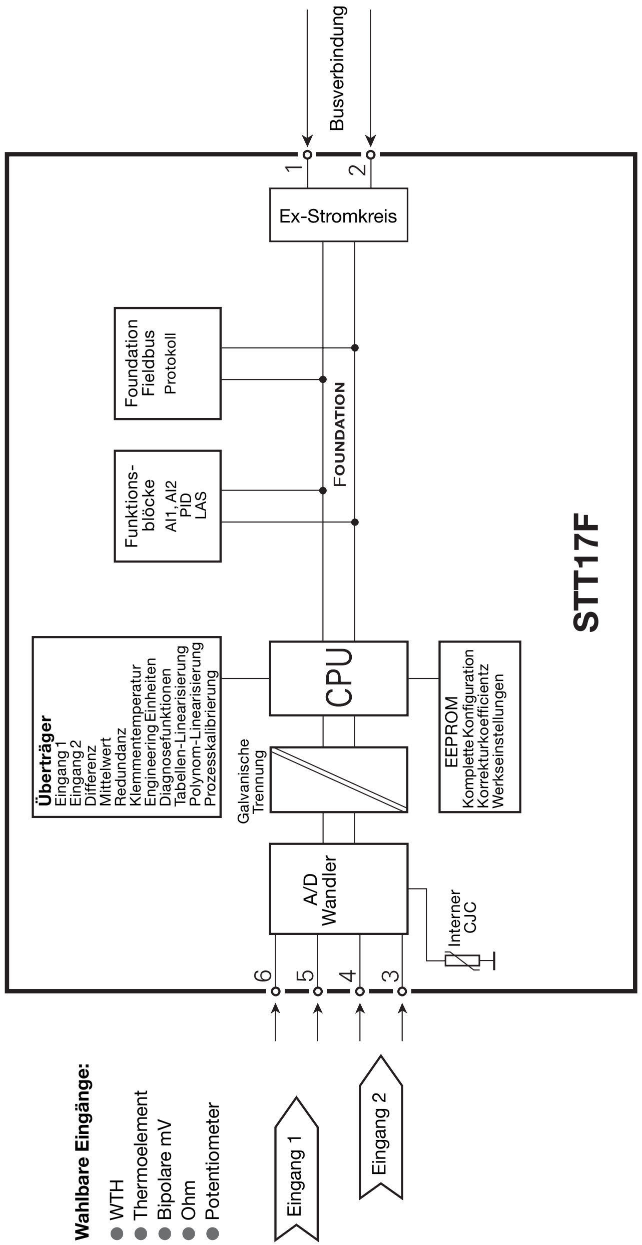


Figure 3-4 Blockdiagramm

3.7 Businstallation

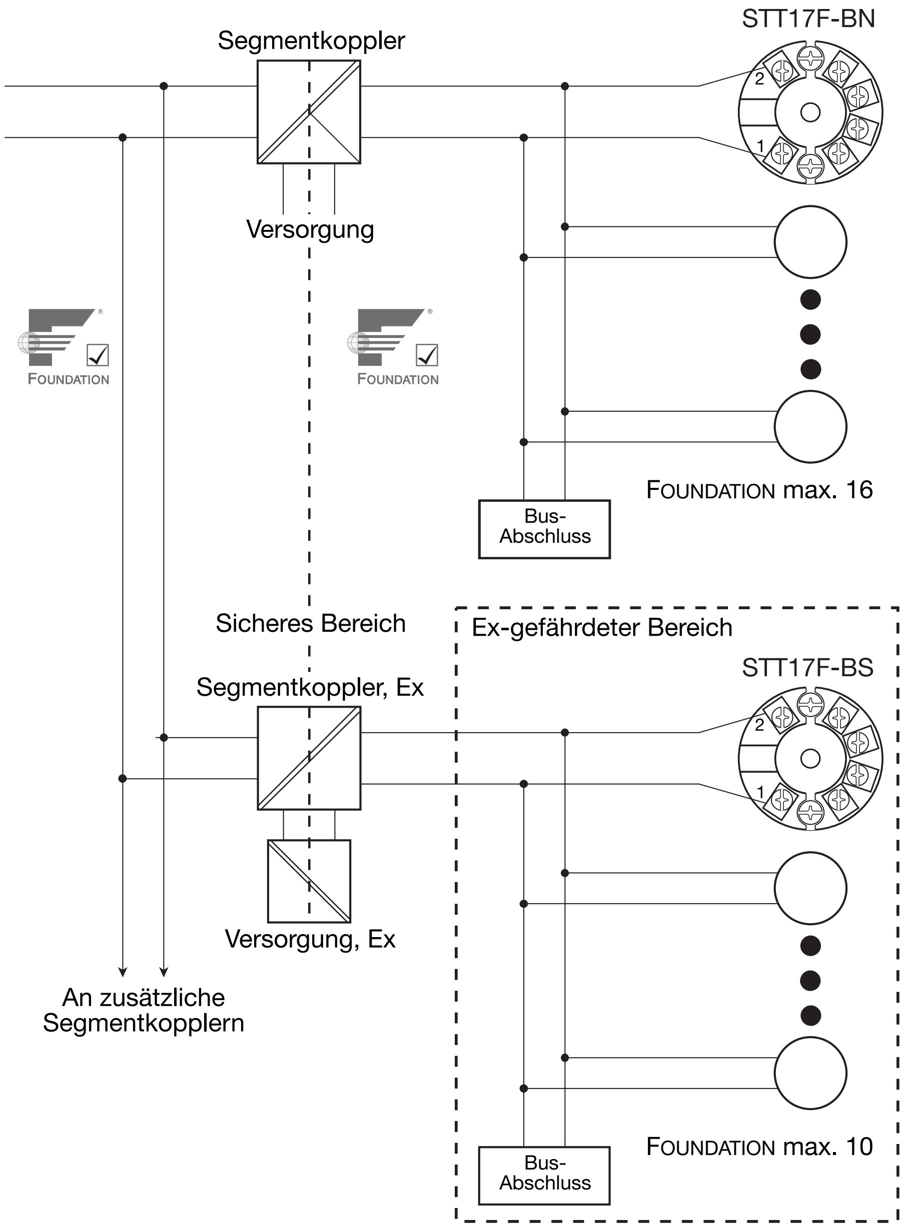


Figure 3-5 Businstallation

3.8 Ex-Daten

EEx- / I.S.-Zulassung STT17F-BN:

KEMA 06ATEX0045 X.................... ⟨Ex⟩ II 3 G
EEx nA [nL] II C T1...T6

Ex- / I.S.-Daten:

	STT17F-BN
	Zone 2, EEx nA [L] IIC
	Division 2, nicht-zündfähig
Einheit	Keine Barriere
U_i T1...T4 T5 T6	32 VDC $T_{Umg.}$ < 85°C $T_{Umg.}$ < 75°C $T_{Umg.}$ < 60°C

Fühlereingang, Klemme 3, 4, 5 und 6:
U_o...: 5,7 VDC
I_o ....: 8,4 mA
P_o...: 12 mW
L_o...: 200 mH
C_o ....: 40 µF

EEx- / I.S.-Zulassung STT17F-BS:

KEMA 06ATEX0046 X.................... ⟨Ex⟩ II 1 GD oder ⟨Ex⟩ II 2 (1) GD
T65°C...T105°C
EEx ia IIC oder
EEx ib [ia] IIC T1...T6
Anwendung in Zone .... 0, 1, 2, 20, 21 oder 22

Ex- / I.S.-Daten:
Signalausgang / Versorgung, Klemme 1 bis 2:
Max. Umgebungstemperatur in Abhängigkeit von P_o des angeschlossenen Ex-Trenners.

Einheit	STT17F-BS			
	Class I, Zone 0, EEx ia IIC, Entity / Fisco			
	IS, Class I, Division 1, Group A, B, C, D Entity / Fisco			
	Barriere mit P_o < 0,84 W	Barriere mit P_o < 1,3 W	Anwendung in FISCO-Systeme	Anwendung in FISCO-Systeme
U_i	30 VDC	30 VDC	17,5 VDC	15 VDC
I_i	120 mADC	300 mADC	250 mADC	900 mA
P_i	0,84 W	1,3 W	2,0 W	5,32 W
L_i	1 µH	1 µH	1 µH	1 µH
C_i	2,0 nF	2,0 nF	2,0 nF	2,0 nF
T1...T4	$T_{Umg.}$ < 85°C	$T_{Umg.}$ < 75°C	$T_{Umg.}$ < 85°C	$T_{Umg.}$ < 85°C
T5	$T_{Umg.}$ < 70°C	$T_{Umg.}$ < 65°C	$T_{Umg.}$ < 60°C	$T_{Umg.}$ < 60°C
T6	$T_{Umg.}$ < 60°C	$T_{Umg.}$ < 45°C	$T_{Umg.}$ < 45°C	$T_{Umg.}$ < 45°C

Einheit	STT17F-BS	
	Class I, Zone 1, EEx ib IIC, Entity / Fisco	
	IS, Class I, Division 2, Group A, B, C, D Entity / Fisco	
	Barriere mit Po < 5,32 W	FISCO Segmentkoppler
U_i	30 VDC	17,5 VDC
I_i	250 mADC	Alle
P_i	5,32 W	Alle
L_i	1 µH	1 µH
C_i	2,0 nF	2,0 nF
T1...T4	$T_{Umg.}$ < 85°C	$T_{Umg.}$ < 85°C
T5	$T_{Umg.}$ < 75°C	$T_{Umg.}$ < 75°C
T6	$T_{Umg.}$ < 60°C	$T_{Umg.}$ < 60°C

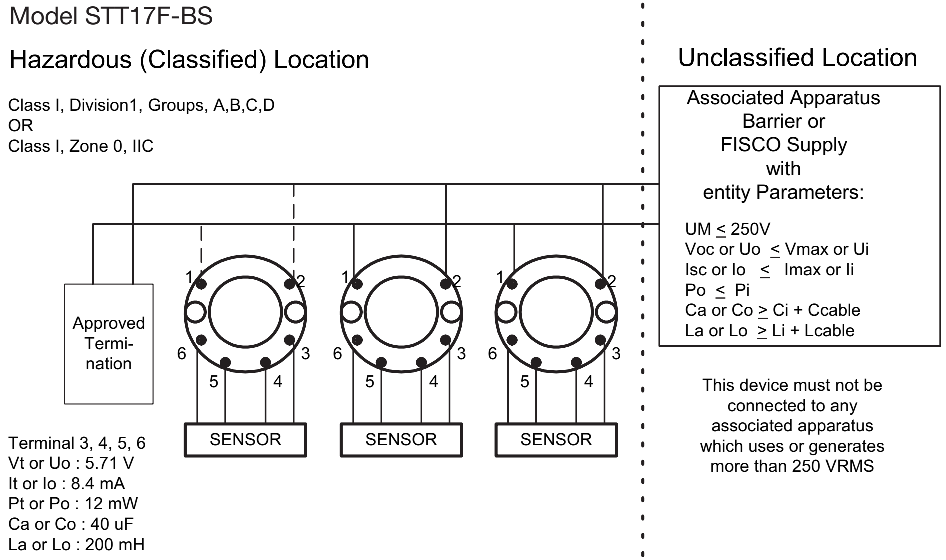
Fühlereingang, Klemme 3, 4, 5 und 6:

U_o .... : 5,7 VDC
I_o .... : 8,4 mA
P_o .... : 12 mW
L_o .... : 200 mH
C_o .... : 40 µF

4. INSTALLATION DRAWINGS

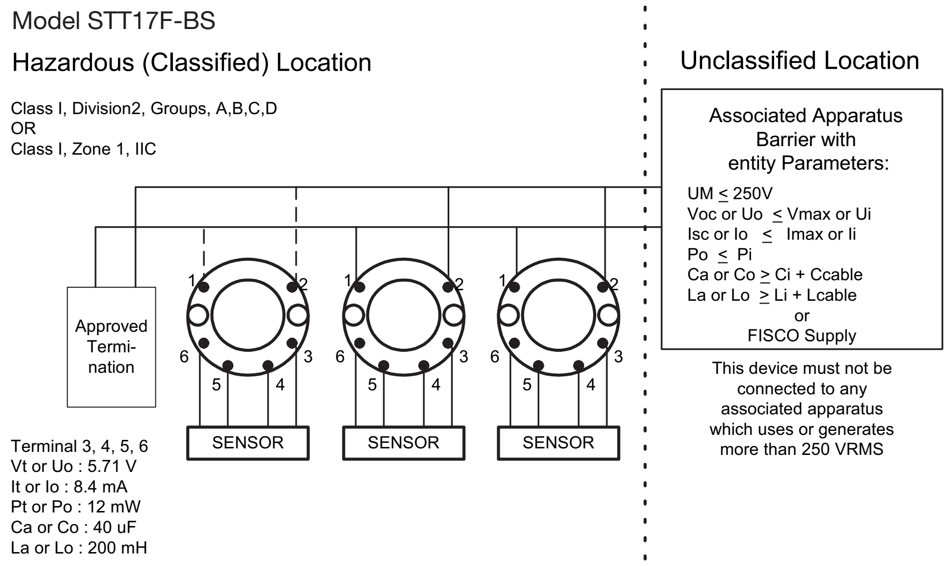
4.1 FM-CSA Installation Drawings 50016325

4.1.1 Model STT17F-BS



Terminal 1, 2				
Class 1, Zone 0, Ex ia IIC, Entity / FISCO				
IS, Class 1, Division 1, Group A, B, C, D Entity / FISCO				
Barrier type:	Linear barrier	Trapezoid barrier	Suitable for FISCO systems	Suitable for FISCO systems
T1...T4:	Ta ≤ +85°C	Ta ≤ +75°C	Ta ≤ +85°C	Ta ≤ +85°C
T5:	Ta ≤ +70°C	Ta ≤ +65°C	Ta ≤ +60°C	Ta ≤ +60°C
T6:	Ta ≤ +60°C	Ta ≤ +45°C	Ta ≤ +45°C	Ta ≤ +45°C
Vmax or Ui	30 V	30 V	17.5 V	15 V
Imax or Ii	120 mA	300 mA	250 mA	900 mA
Pi	0.84 W	1.3 W	2.0 W	5.32 W
Ci	2.0 nF	2.0 nF	2.0 nF	2.0 nF
Li	1 µH	1 µH	1 µH	1 µH

Figure 4-1 Model STT17F-BS
[Class 1, Div 1, Groups A,B,C,D or Class 1, Zone 0 IIC]

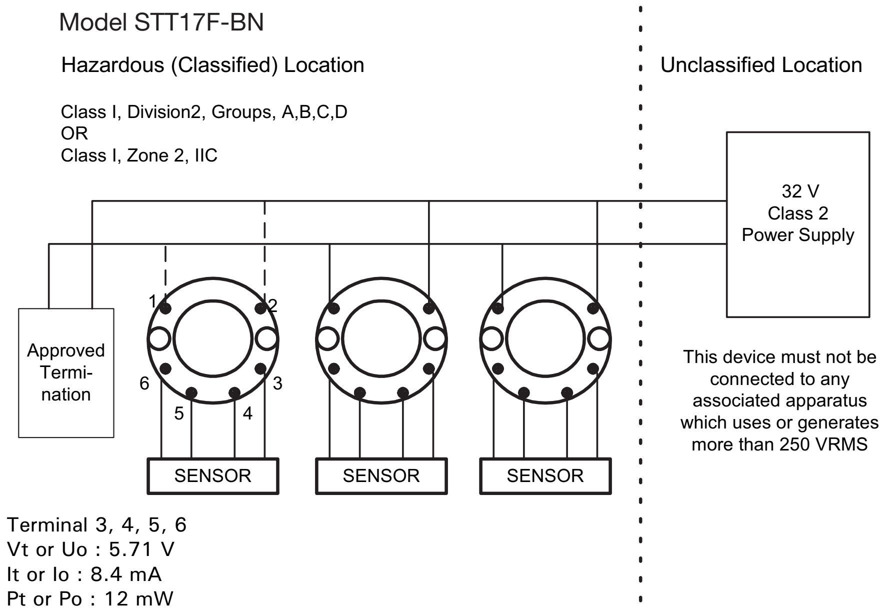


Entity Parameters		
Terminal 1, 2		
Class 1, Zone 1, Ex ib IIC Entity / FISCO		
Barrier type:	Rectangular barrier	FISCO Segment coupler
T1...T4:	Ta ≤ +85°C	Ta ≤ +85°C
T5:	Ta ≤ +75°C	Ta ≤ +75°C
T6:	Ta ≤ +60°C	Ta ≤ +60°C
VmaX / Ui	30 V	17.5 V
Imax or Ii	250 mA	any
Pi	5.32 W	any
Ci	2.0 nF	2.0 nF
Li	1 µH	1 µH

Nonincendive Field Wiring parameters		
Terminal 1, 2		
NI, Class 1, Division 2, Group A, B, C, D NIFW / FNICO		
T1...T4:	Ta ≤ +85°C	Ta ≤ +85°C
T5:	Ta ≤ +75°C	Ta ≤ +75°C
T6:	Ta ≤ +60°C	Ta ≤ +60°C
VmaX / Ui	30 V	17.5 V
Pi	5.32 W	any
Ci	2.0 nF	2.0 nF
Li	1 µH	1 µH
For a current-controlled circuits the parameter Imax is not required and need not be aligned with the parameter Isc or It of the barrier or associated nonincendive field wiring apparatus.		

Figure 4-2 Model STT17F-BS
[Class 1, Div 2, Groups A,B,C,D or Class 1, Zone 1 IIC]

4.1.2 Model STT17F-BN



Terminal 3, 4, 5, 6
Vt or Uo : 5.71 V
It or Io : 8.4 mA
Pt or Po : 12 mW
Ca or Co : 40 µF
La or Lo : 200 mH

Terminal 1.2
Ci: 2.0 nF

T1..T4	-40°C ≤ Ta ≤ +85°C
T5	-40°C ≤ Ta ≤ +75°C
T6	-40°C ≤ Ta ≤ +60°C

Figure 4-3 Model STT17F-BN
[Class 1, Div 2, Groups A,B,C,D or Class 1, Zone 2 IIC]

4.1.3 Installation Notes

FM / CSA:

For installation in the US the equipment shall be installed according to the National Electrical Code (ANSI-NFPA 70).

For installation in Canada the transmitter shall be installed in a suitable enclosure to meet installation codes stipulated in the Canadian Electrical Code (CEC).

The Entity Concept:

Equipment that is FM- / CSA-approved for intrinsic safety may be connected to barriers based on the ENTITY CONCEPT. This concept permits interconnection of approved transmitters, meters and other devices in combinations which have not been specifically examined by FM / CSA, provided that the agency's criteria are met. The combination is intrinsically safe, if the entity concept is acceptable to the authority having jurisdiction over the installation.

The entity concept criteria are as follows:

The intrinsically safe devices, other than barriers, must not be a source of power.

The maximum voltage U_i (V_{max}) and current I_i (I_{max}), and maximum power P_i (P_{max}), which the device can receive and remain intrinsically safe, must be equal to or greater than the voltage (U_o or V_{OC} or V_t) and current (I_o or I_{SC} or I_t) and the power P_o which can be delivered by the barrier.

The sum of the maximum unprotected capacitance (Ci) for each intrinsically device and the interconnecting wiring must be less than the capacitance (Ca) which can be safely connected to the barrier.

The sum of the maximum unprotected inductance (Li) for each intrinsically device and the interconnecting wiring must be less than the inductance (La) which can be safely connected to the barrier.

The entity parameters U_o,V_{OC} or V_t and I_o, I_{SC} or I_t, and Ca and La for barriers are provided by the barrier manufacturer.

FISCO/FNICO Rules:

The FISCO Concept allows the interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criterion for such interconnection is that the voltage

(V_{max}), the current (I_{max}) and the power (P_i) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (U_o, V_{oc}, V_t), the current (I_o, I_{sc}, I_t,) and the power (P_o) which can be provided by the associated apparatus (supply unit). In addition, the maximum unprotected residual capacitance (C_i) and inductance (L_i) of each apparatus (other than the terminators) connected to the Fieldbus must be less than or equal to:

FISCO: 5 nF and 10 mH.
FNICO: 5 nF and 20 mH

Nonincendive Field Wiring Concept:

The Nonincendive Field Wiring concept allows for the interconnection of nonincendive field wiring apparatus using any of the wiring methods permitted for unclassified locations.

V_{max} >= V_{oc} or V_t, Ca >= C_i +C_{cable}, La >= L_i + L_{cable}

The Nonincendive Field Wiring concept allows the interconnection of FM-approved nonincendive devices with FNICO parameters not specifically examined in combination as a system when:
U_o or V_{oc} or V_t <= V_{max}, P_o <= P_i

In each I.S. Fieldbus segment only one active source, normally the associated apparatus, is allowed to provide the necessary power for the Fieldbus system. The allowed voltage (U_o, V_{oc}, V_t) of the associated apparatus used to supply the bus must be limited to the range of 14 Vdc to 24 Vdc. All other equipment connected to the bus cable has to be passive, meaning that the apparatus is not allowed to provide energy to the system, except to a leakage current of 50 mA for each connected device. Separately powered equipment needs a galvanic isolation to insure that the intrinsically safe Fieldbus circuit remains passive.

The cable used to interconnect the devices needs to comply with the following parameters:

Loop resistance R':	15…150 W/km
Inductance per unit length L':	0.4…1mH/km
Capacitance per unit length C':	80 ...200 nF/km

C' = C' line/line + 0.5 C' line/screen, if both lines are floating

OR

C'= C' line/line + C' line/screen, if the screen is connected to one line

Length of spur Cable:	max. 30 m
Length of trunk cable:	max. 1 Km
Length of splice:	max. 1 m

Terminators

At each end of the trunk cable an approved line terminator with the following parameters is suitable:

R = 90 ...100 W

C = 0 ...2.2 mF.

System evaluation:

The number of passive devices like transmitters, actuators, connected to a single bus segment is not limited due to I.S. or N.I. reasons. Furthermore, if the above rules are respected, the inductance and capacitance of the cable need not to be considered and will not impair the intrinsic safety or nonincendive safety of the installation as applicable.

The sensor circuit is not infallibly galvanically isolated from the Fieldbus input circuit. However, the galvanic isolation between the circuits is capable of withstanding a test voltage of 500 Vac during 1 minute.

Installation Notes for FISCO and Entity Concepts:

1. The Intrinsic Safety Entity concept allows the interconnection of FM- / CSA-approved intrinsically safe devices (Div. 1 or Zone 0 or Zone1), with entity parameters not specifically examined in combination as a system when:
   Uo or Voc or Vt ≤ Vmax, Io or Isc or It ≤ Imax, Po ≤ Pi.
   Ca or Co ≥ ΣCi + ΣCcable, La or Lo ≥ ΣLi + ΣLcable, Po ≤ Pi.
2. The Intrinsic Safety FISCO concept allows the interconnection of FM- / CSA-approved intrinsically safe devices with FISCO parameters not specifically examined in combination as a system when:
   Uo or Voc or Vt ≤ Vmax, Io or Isc or It ≤ Imax, Po ≤ Pi.
3. Control equipment connected to the Associated Apparatus must not use or generate more than 250 Vrms or Vdc.
4. Intrinsically Safe Installation should be in accordance with ANSI/ISA RP12.6.01 (except chapter 5 for FISCO Installations) "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code® (ANSI/NFPA 70) Sections 504 and 505.
5. The configuration of associated Apparatus must be FM Approved or CSA Approved under the associated concept.
6. Associated Apparatus manufacturer's installation drawing must be followed when installing this equipment.
7. The equipment is approved for Class I, Zone 0, applications.
   If connecting AEx[ib] associated Apparatus or AEx ib I.S. Apparatus to the equipment the I.S. circuit is only suitable for Class I, Zone 1, or Class I, Zone 2, and is not suitable for Class I, Zone 0 or Class I, Division 1, "Hazardous (Classified) Locations".
8. No revision to drawing without prior FM / CSA Approval.
9. Simple Apparatus is defined as a device that neither generates nor stores more than 1.5 V, 0.1 A or 25 mW.
10. The termination must be NRTL-approved, and the resistor must be infallible.
11. **Warning:**

    For applications in Div. 2 or Zone 2 (Classified Locations) Explosion hazard: Except for nonincendive field circuits, do not disconnect the apparatus unless the area is known to be non hazardous.
12. **Warning:**

    Substitution of Components May Impair Safety.

5. DECLARATION OF CONFORMITY

We declare under our sole responsibility that the following product in the STT 3000 Temperature Transmitter series:

STT17F Smart Temperature Transmitter

is in conformity with the following directives and standards:

EMC directive 2004/108/EC and later amendments

EN 61326

This declaration is issued in compliance with article 10, subclause 1 of the EMC directive. For specification of the acceptable EMC performance level, refer to the electrical specifications for the module.

The ATEX directive 94/9/EC and later amendments

EN 50014, EN 50020,
EN 50281-1-1, EN 50284,
EN 60079-0 and EN 60079-15
IEC 60079-27 (FISCO)
ATEX certificate: KEMA 06ATEX0045 X (STT17F-BN)
ATEX certificate: KEMA 06ATEX0046 X (STT17F-BS)

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