

SIEMENS

SITRANS

Temperature transmitter SITRANS TH400

Operating Instructions

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7NG3214 SITRANS TH400 with PROFIBUS PA
7NG3215 SITRANS TH400 with FOUNDATION
fieldbus




03/2014

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

 DANGER
indicates that death or severe personal injury will result if proper precautions are not taken.
 WARNING
indicates that death or severe personal injury may result if proper precautions are not taken.
 CAUTION
indicates that minor personal injury can result if proper precautions are not taken.
NOTICE
indicates that property damage can result if proper precautions are not taken.


If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

 WARNING
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Introduction

1.1 Purpose of this documentation

These instructions contain all information required to commission and use the device. It is your responsibility to read the instructions carefully prior to installation and commissioning. In order to use the device correctly, first review its principle of operation.

The instructions are aimed at persons mechanically installing the device, connecting it electronically, configuring the parameters and commissioning it, as well as service and maintenance engineers.

1.2 History

This history establishes the correlation between the current documentation and the valid firmware of the device.

The documentation of this edition is applicable for the following firmware variants:

Edition	Firmware identification type plate	System integration	Installation path for PDM
PROFIBUS PA version:			
01 02/2007	FW: V2.03 and FW: V2.04 Note: The firmware revision of TH400 PROFIBUS PA 2.04 is equivalent to the firmware revision 2.03, even if the GSD/EDD indicates firmware revision 2.03.	PDM V6.0 DD rev. 1.00	SITRANS TH400
02 06/2010			
03 03/2014			
FOUNDATION fieldbus version:			
01 02/2007	FW: V2.03 and FW: V2.04	Standard fieldbus compatible control systems	Not relevant.
02 06/2010			
03 03/2014			

The most important changes in the documentation when compared with the respective previous edition are given in the following table.

Edition	Remarks
01 02/2007	First edition
02 06/2010	Revised safety information, modifications in chapter "Connection"
03 03/2014	Firmware version added.

1.3 Notes on warranty

The contents of this manual shall not become part of or modify any prior or existing agreement, commitment or legal relationship. The sales contract contains all obligations on the part of Siemens as well as the complete and solely applicable warranty conditions. Any statements regarding device versions described in the manual do not create new warranties or modify the existing warranty.

The content reflects the technical status at the time of publishing. Siemens reserves the right to make technical changes in the course of further development.

1.4 Environmental protection

Recycling


Devices described in this programming manual can be recycled.

Please contact a certified waste disposal company for eco-friendly recycling and disposal instructions.

General safety notes

This device left the factory in good working condition. In order to maintain this status and to ensure safe operation of the device, observe these instructions and all the specifications relevant to safety.

Observe the information and symbols on the device. Do not remove any information or symbols from the device. Always keep the information and symbols in a completely legible state.

Symbol	Meaning
	Pay attention to the operating instructions

Observe the test certification, provisions and laws applicable in your country during connection, assembly and operation. These include, for example:

- National Electrical Code (NEC - NFPA 70) (USA)
- Canadian Electrical Code (CEC) (Canada)

Further provisions for hazardous area applications are for example:

- IEC 60079-14 (international)
- EN 60079-14 (EC)

The CE mark on the device is a sign of conformity with the following European directives:

Electromagnetic
Compatibility EMC
2004/108/EC

Directive of the European Parliament and of the Council on the approximation of the laws of the Member States relating to electromagnetic compatibility and repealing Directive 89/336/EEC.

Atmosphère explosible
ATEX
94/9/EC

Directive of the European Parliament and the Council on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres.

The directives applied can be found in the EC declaration of conformity for the associated device.

 **WARNING**

Improper device modifications

Danger to personnel, system and environment can result from modifications to the device, particularly in hazardous areas.

- Only carry out modifications that are described in the instructions for the device. Failure to observe this requirement cancels the manufacturer's warranty and the product approvals.

Qualified personnel for hazardous area applications

Persons who install, connect, commission, operate, and service the device in a hazardous area must have the following specific qualifications:

- They are authorized, trained or instructed in operating and maintaining devices and systems according to the safety regulations for electrical circuits, high pressures, aggressive, and hazardous media.
- They are authorized, trained, or instructed in carrying out work on electrical circuits for hazardous systems.
- They are trained or instructed in maintenance and use of appropriate safety equipment according to the pertinent safety regulations.

 **WARNING**

Unsuitable device for the hazardous area

Danger of explosion.

- Only use equipment that is approved for use in the intended hazardous area and labelled accordingly.

 **WARNING**

Loss of safety of device with type of protection "Intrinsic safety Ex i"

If the device has already been operated in non-intrinsically safe circuits or the electrical specifications have not been observed, the safety of the device is no longer ensured for use in hazardous areas. There is a danger of explosion.

- Connect the device with type of protection "Intrinsic safety" solely to an intrinsically safe circuit.
- Observe the specifications for the electrical data on the certificate and in Chapter "Technical data".

Description

3.1 Summary

The temperature transmitter SITRANS TH400 is available in to basic versions for the fieldbus protocols:

- PROFIBUS PA (7NG3214 ...)
- FOUNDATION fieldbus (7NG3215 ...)

3.2 Application range

- Linearized temperature measurement with a resistance thermometer or thermocouple;
- Difference, mean value, or redundant temperature measurement with resistance thermometer or thermocouple;
- Linear resistance and bipolar millivolt measurements;
- Difference, mean value or redundant resistance and bipolar millivolt measurement.

Install and operate the explosion-proof transmitter in hazardous areas according to the specifications of the EC-type examination certificate per ATEX and these Operating Instructions or the inspection certificate valid in your country.

3.3 Product features

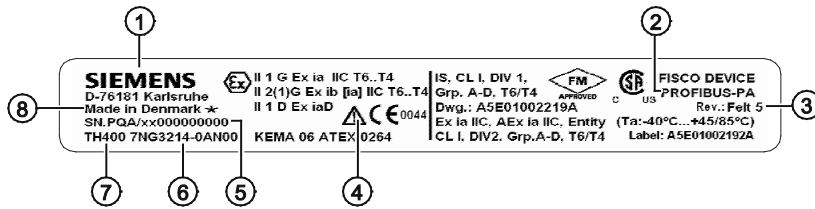
- Installation in the type B connection head per DIN 43729 or a larger connection head.
- Transmitter with PROFIBUS PA communication
- Transmitter with FOUNDATION fieldbus communication
- Capable of communication via PROFIBUS PA and FOUNDATION fieldbus. For example, sensor activation and measuring range can be programmed with it.
- Configuration via PROFIBUS PA with SIMATIC PDM (SITRANS TH400 as PROFIBUS PA version) or via FOUNDATION fieldbus with Emerson AMS, handheld 375 (SITRANS TH400 as FOUNDATION fieldbus version).
- The simulation mode in FOUNDATION fieldbus is activated with a magnetic pin.
- Polarity-independent bus connection
- 24 bit analog-to-digital converter for a high resolution
- PROFIBUS PA function blocks: Two analog
- FOUNDATION fieldbus function blocks: Two analog and one PID

3.4 Type plate structure

- FOUNDATION fieldbus functionality: Basic or LAS.
- Galvanical isolation
- Intrinsically safe version for use in hazardous areas
- Special characteristic curve

3.4 Type plate structure

The nameplate is located on the housing and carries the order number and other important product information; see following example.



- ① Manufacturer
- ② Device version: PROFIBUS PA or FOUNDATION Fieldbus
- ③ Hardware and firmware revision
- ④ Pay attention to the Operating Instructions
- ⑤ Serial number with coded production year and production month
- ⑥ Order number
- ⑦ Type designation
- ⑧ Country of origin

Figure 3-1 Nameplate structure SITRANS TH400

3.5 Mode of operation

In what follows, the mode of operation of the transmitter is explained using the function block diagram.

The two versions of the SITRANS TH400 (7NG3214 ... and 7NG3215 ...) are distinguished solely by the type of the fieldbus protocols (PROFIBUS PA or FOUNDATION fieldbus).

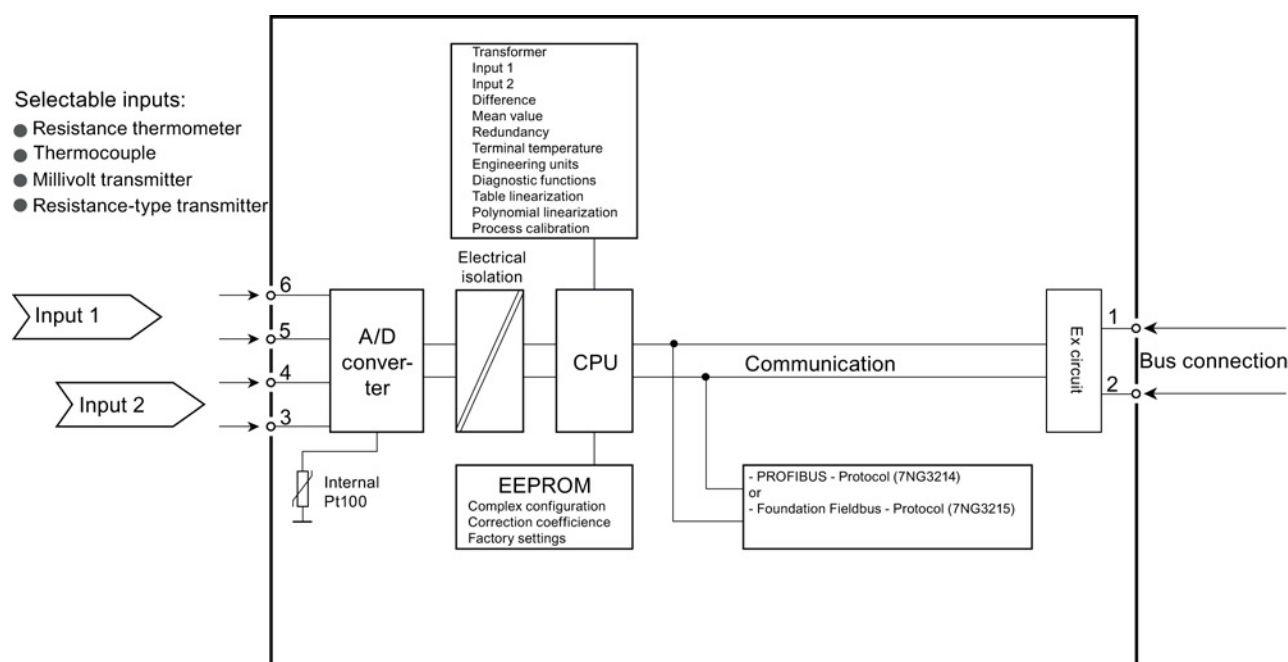


Figure 3-2 Function block diagram SITRANS TH400

3.6 System communication

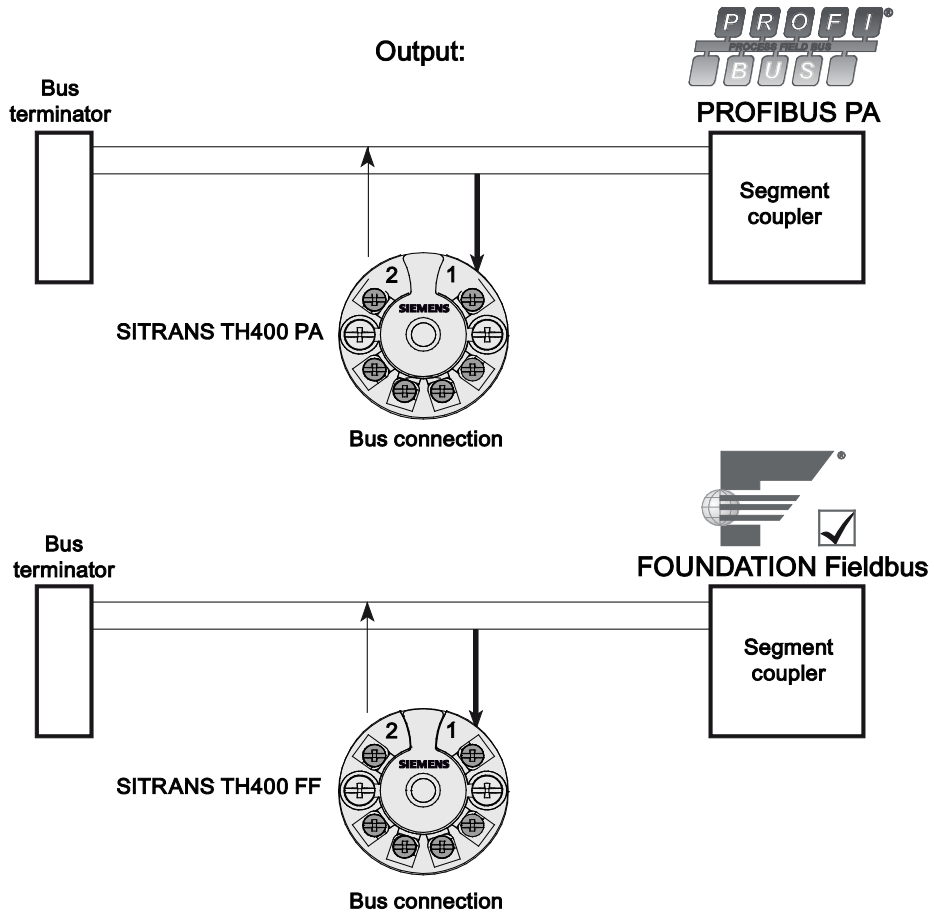





Figure 3-3 Communications interface


Mounting

4.1 Safety Notes

 WARNING
Mounting in hazardous areas Make sure you observe the following information before installing the transmitter: <ul style="list-style-type: none">• Install the transmitter in an enclosure appropriate for the envisaged application• In hazardous areas, also observe the requirements specified in the Ex certificates and approvals.

 WARNING
Exceeded maximum ambient or process media temperature Danger of explosion in hazardous areas. Device damage. <ul style="list-style-type: none">• Make sure that the maximum permissible ambient and process media temperatures of the device are not exceeded. Refer to the information in Chapter "Auto-Hotspot".

 WARNING
Open cable inlet or incorrect cable gland Danger of explosion in hazardous areas. <ul style="list-style-type: none">• Close the cable inlets for the electrical connections. Only use cable glands or plugs which are approved for the relevant type of protection.

 WARNING
Incorrect conduit system Danger of explosion in hazardous areas as result of open cable inlet or incorrect conduit system. <ul style="list-style-type: none">• In the case of a conduit system, mount a spark barrier at a defined distance from the device input. Observe national regulations and the requirements stated in the relevant approvals.

4.2 Installation in the connection head

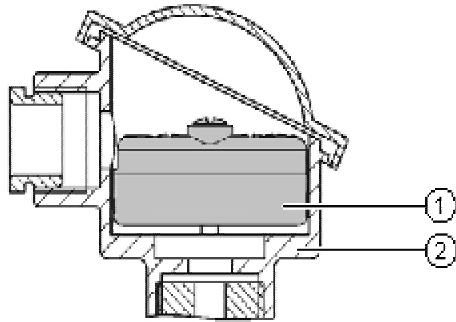
Note

The transmitter is only designed for installation in a type B connection head or larger.

The transmitter is either secured in the base of the connection head or in the raised cover of the connection head. Included in the transmitter's scope of delivery are:

- Springs
- Fixing screws

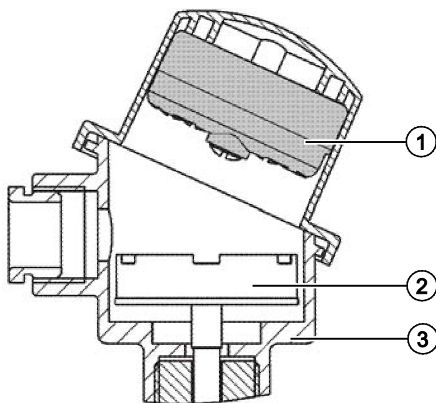
Securing the transmitter in the connection head base



① Transmitter

② Connection head

Securing the transmitter in the connection head cover



① Transmitter

② Ceramic base of the measuring element

③ Connection head

4.3 Installation on DIN rail and G rail

You can either install the transmitter on a DIN rail with 35 mm or on a G rail with 32 mm. DIN EN 60715 applies to DIN rails and G rails in this context. The DIN rail adapter required for installation can be ordered as an accessory under the Order No. 7NG3092-8KA.

Adhere to the ambient conditions specified in the technical data.

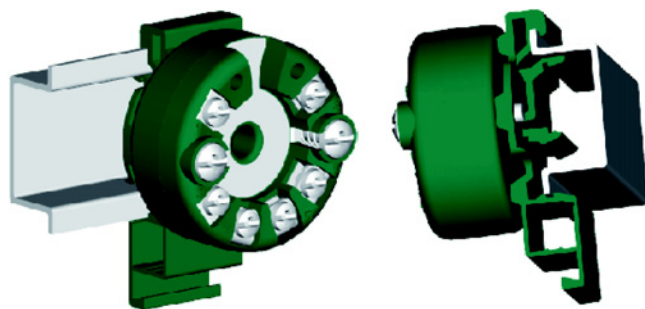


Figure 4-1 Securing the transmitter on DIN rails



Figure 4-2 Securing the transmitter on G rails

Mounting

4.3 Installation on DIN rail and G rail

Connecting

5.1 Safety Notes

Note

National regulations

Be sure to observe the regulations valid and relevant in your country.

Note

To improve the interference immunity:

- Lay signal cables separately from cables with voltages > 60 V.
 - Use cables with twisted wires.
 - Avoid getting too close to large electrical systems or use shielded cables.
 - Use shielded cable to guarantee the full specification according to PROFIBUS PA or FOUNDATION Fieldbus.
 - Use only cable entries and covers that are approved for the relevant use.
 - At an ambient temperature $T \geq 60 \text{ }^\circ\text{C}$, use heat-resistant cables approved for an ambient temperature of at least 20 K higher.
 - Use cables with wires that have a maximum cross-sectional area of 2.5 mm^2 .
-

See also

Connection diagrams (Page 24)

 WARNING
--

<p>Unsuitable cables and/or cable glands</p>

<p>Danger of explosion in hazardous areas.</p>
--

- | |
|--|
| <ul style="list-style-type: none"> • Only use suitable cables and cable glands complying with the requirements specified in Chapter "Technical data". • Tighten the cable glands in accordance with the torques specified in Chapter "Technical data". • When replacing cable glands use only cable glands of the same type. • After installation check that the cables are seated firmly. |
|--|

 **WARNING**

Dangerous contact voltage

Danger of electric shock in case of incorrect connection.

- For the electrical connection specifications, refer to the information in Chapter "Auto-Hotspot".
- At the mounting location of the device observe the applicable directives and laws for installation of electrical power installations with rated voltages below 1000 V.

NOTICE

Ambient temperature too high

Damage to cable sheath.

- At an ambient temperature $\geq 60\text{ °C}$ (140 °F), use heat-resistant cables suitable for an ambient temperature at least 20 °C (68 °F) higher.

 **WARNING**

Improper power supply

Danger of explosion in hazardous areas as result of incorrect power supply, e.g. using direct current instead of alternating current.

- Connect the device in accordance with the specified power supply and signal circuits. The relevant specifications can be found in the certificates, in Chapter "Auto-Hotspot" or on the nameplate.

 **WARNING**

Improper laying of shielded cables

Danger of explosion through compensating currents between hazardous area and the non-hazardous area.

- Only ground shielded cables that run into the hazardous area at one end.
- If grounding is required at both ends, use an equipotential bonding conductor.

 **WARNING**

Connecting device in energized state

Danger of explosion in hazardous areas.

- Connect devices in hazardous areas only in a de-energized state.

Exceptions:

- Circuits of limited energy may also be connected in the energized state in hazardous areas.
- Exceptions for type of protection "Non-sparking nA" (Zone 2) are regulated in the relevant certificate

 **WARNING**

Incorrect selection of type of protection

Danger of explosion in areas subject to explosion hazard.

This device is approved for several types of protection.

1. Decide in favor of one type of protection.
2. Connect the device in accordance with the selected type of protection.
3. In order to avoid incorrect use at a later point, make the types of protection that are not used permanently unrecognizable on the nameplate.

Note


Improvement of interference immunity

- Lay signal cables separate from cables with voltages > 60 V.
- Use cables with twisted wires.
- Keep device and cables in distance to strong electromagnetic fields.
- Use shielded cables to guarantee the full specification according to HART.
- Refer to HART communication information in Chapter "Auto-Hotspot".

 **WARNING**

Limited range of use

If the device has been operated outside the ambient conditions specified for potentially explosive atmospheres, you may no longer operate the device in potentially explosive atmospheres. Make sure to permanently mask all Ex markings on the nameplate.

 WARNING
<p>Risk of explosion when using unsuitable HART device</p> <p>Only intrinsically safe HART modems or HART communicators are allowed to be operated in the intrinsically safe area or on intrinsically safe circuits.</p>

Note

Electrical data and T_{amb}

Electrical data and T_{amb} are dependent on Ex-protection class, see Certificates (<http://www.siemens.com/processinstrumentation/certificates>)

5.1.1 Safety notes for connecting in hazardous TH400

The input circuit is thus electrically isolated from the sensor circuit. The isolation does not satisfy the requirements for infallible electrical isolation in the sense of the intrinsic safety standard EN / IEC 60079-11, but does withstand a test voltage of 500 V AC/1 minute.

Zone 0 in type of protection "ia" - intrinsic safety

- Only connect the transmitter, in accordance with the certificate of compliance, to devices certified as intrinsically-safe.
- If the connection head is made of aluminum, the requirements of EN 60079-26, section 4.3.3, must be observed for uses where the device category 1 G is required.
- The transmitter must be mounted in an enclosure in order to provide a degree of protection of at least IP20 according to EN60529

Table 5- 1 For T_a ≤ 85 °C (T4); T_a ≤ 70 °C (T5); T_a ≤ 60 °C (T6)

Maximum values of the auxiliary power supply and signal circuits:		
U _i = 30 V DC	I _i = 120 mA	P _i = 840 mW
L _i = 1 μH	C _i = 2 nF	

Table 5- 2 For T_a ≤ 75 °C (T4); T_a ≤ 65 °C (T5); T_a ≤ 45 °C (T6)

Maximum values of the auxiliary power supply and signal circuits:		
U _i = 30 V DC	I _i = 300 mA	P _i = 1300 mW
L _i = 1 μH	C _i = 2 nF	

Table 5- 3 For $T_a \leq 85\text{ °C}$ (T4); $T_a \leq 60\text{ °C}$ (T5); $T_a \leq 45\text{ °C}$ (T6)

Maximum values of the auxiliary power supply and signal circuits in accordance with FISCO:		
$U_i = 17.5\text{ V DC}$	$I_i = 250\text{ mA}$	$P_i = 2000\text{ mW}$
$L_i = 1\text{ }\mu\text{H}$	$C_i = 2\text{ nF}$	

Table 5- 4 For $T_a \leq 85\text{ °C}$ (T4); $T_a \leq 60\text{ °C}$ (T5); $T_a \leq 45\text{ °C}$ (T6)

Maximum values of the auxiliary power supply and signal circuits in accordance with FISCO:		
$U_i = 15\text{ V DC}$	$I_i = \text{any}$	$P_i = \text{any}$
$L_i = 1\text{ }\mu\text{H}$	$C_i = 2\text{ nF}$	

Maximum values of the sensor circuit for Ex ia:		
$U_0 = 5.7\text{ V DC}$:	$I_0 = 8.4\text{ mA}$	$P_0 = 12\text{ mW}$
L_0 [mH]	200	
C_0 [μF]	40	

Zone 1 in type of protection "ib" - intrinsic safety

- Only connect the transmitter, in accordance with the certificate of compliance, to devices certified as intrinsically-safe.
- The transmitter must be mounted in an enclosure in order to provide a degree of protection of at least IP20 according to EN60529

Table 5- 5 For $T_a \leq 85\text{ °C}$ (T4); $T_a \leq 75\text{ °C}$ (T5); $T_a \leq 60\text{ °C}$ (T6)

Maximum values of the auxiliary power supply and signal circuits:		
$U_i = 30\text{ V DC}$	$I_i = 250\text{ mA}$	$P_i = 5320\text{ mW}$
$L_i = 1\text{ }\mu\text{H}$	$C_i = 2\text{ nF}$	

Table 5- 6 For $T_a \leq 85\text{ °C}$ (T4); $T_a \leq 75\text{ °C}$ (T5); $T_a \leq 60\text{ °C}$ (T6)

Maximum values of the auxiliary power supply and signal circuits in accordance with FISCO:		
$U_i = 17.5\text{ V DC}$	$I_i = \text{any}$	$P_i = \text{any}$
$L_i = 1\text{ }\mu\text{H}$	$C_i = 2\text{ nF}$	

Maximum values of the sensor circuit for Ex ia:		
$U_0 = 5.7\text{ V DC}$:	$I_0 = 8.4\text{ mA}$	$P_0 = 12\text{ mW}$
L_0 [mH]	200	
C_0 [μF]	40	

Zone 2 in type of protection "nL/ic"

- Install the transmitter in an enclosure meeting the degree of protection IP54 per EN 60529, e.g. in a type B connection head per DIN 43729.
- Only connect the transmitter to devices that have at least been approved as certified devices of Category 3.
- Be sure to observe the respective values.

Table 5- 7 For $T_a \leq 85 \text{ }^\circ\text{C}$ (T4); $T_a \leq 75 \text{ }^\circ\text{C}$ (T5); $T_a \leq 60 \text{ }^\circ\text{C}$ (T6)

Maximum values of the auxiliary power supply and signal circuits:		
$U_i = 32 \text{ V DC}$	$I_i = \text{any}$	$P_i = \text{any}$
$L_i = 1 \text{ } \mu\text{H}$	$C_i = 2 \text{ nF}$	

Table 5- 8 For $T_a \leq 85 \text{ }^\circ\text{C}$ (T4); $T_a \leq 75 \text{ }^\circ\text{C}$ (T5); $T_a \leq 60 \text{ }^\circ\text{C}$ (T6)

Maximum values of the auxiliary power supply and signal circuits in accordance with FNICO/FISCO:		
$U_i = 17.5 \text{ V DC}$	$I_i = \text{any}$	$P_i = \text{any}$
$L_i = 1 \text{ } \mu\text{H}$	$C_i = 2 \text{ nF}$	

Maximum values of the sensor circuit:		
$U_0 = 5.7 \text{ V DC}$:	$I_0 = 8.4 \text{ mA}$	$P_0 = 12 \text{ mW}$
$L_0 \text{ [mH]}$	200	
$C_0 \text{ [}\mu\text{F]}$	40	

Zone 2 in type of protection "nA" - non-sparking resources

- Install the transmitter in an enclosure meeting the degree of protection IP54 per EN 60529, e.g. in a type B connection head per DIN 43729.
- Adhere to the conditions for installers applicable to this type of protection.
- The maximum approved input voltage is $U_n = 32 \text{ V DC}$.

Maximum values of the sensor circuit:		
$U_0 = 5.7 \text{ V DC}$:	$I_0 = 8.4 \text{ mA}$	$P_0 = 12 \text{ mW}$
$L_0 \text{ [mH]}$	200	
$C_0 \text{ [}\mu\text{F]}$	40	

Additional requirements for use in dust explosion protected areas

Install the transmitter in an enclosure suitable for the respective type of dust and corresponding Zone in accordance with the inspection certificate valid in your country. The surface temperature of the enclosure is equal to T_a plus 20 K for a dust layer with a maximum thickness of 5 mm.

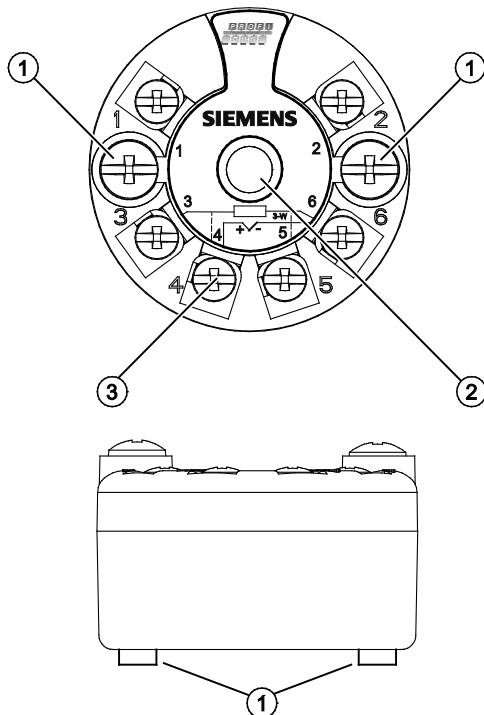
5.1.2 Special safety consideration for connecting SITRANS TH300/TH400

- Use shielded cables to ensure the full specification according to HART, PROFIBUS PA, or FOUNDATION Fieldbus

5.1.3 Test terminals for output signal

The "Test +" and "Test -" test terminals are used for checking the 4 to 20 mA current with an amperemeter. The voltage drop across the amperemeter must not exceed 0.4 V for a 23 mA output current.

5.2 Connection assignments

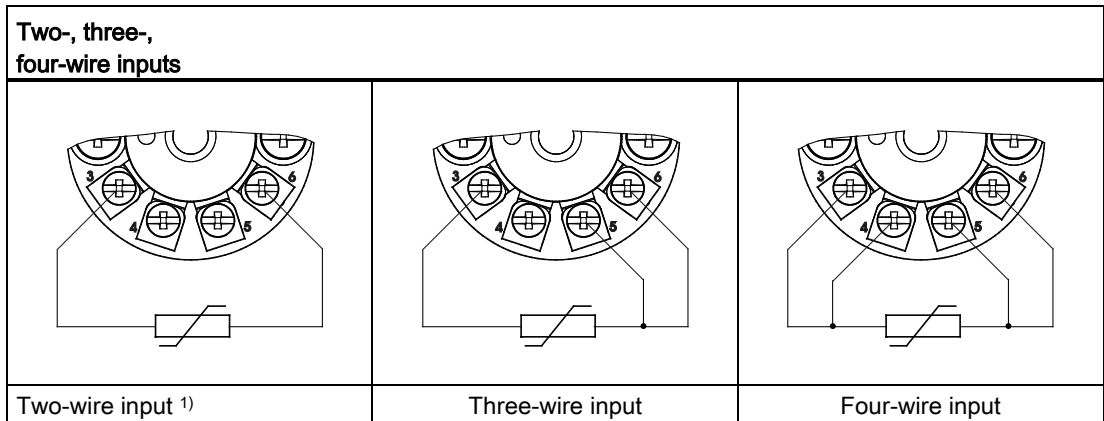


- ① Fixing screw M4x30
 - ② Inside diameter of center hole 6.3 mm (0.25 inch)
 - ③ Fixing screws for the connecting cables 1 to 6
- Connections: 1 and 2 Power supply connection U_{aux} , bus connection
 3, 4, 5, and 6 Sensor connections

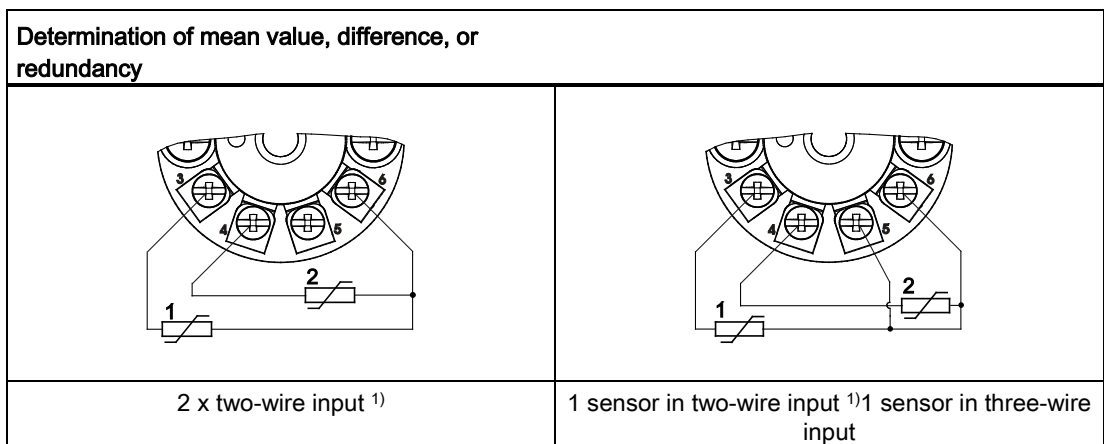
Figure 5-1 SITRANS TH400 connections

5.3 Connection diagrams

Resistance thermometer

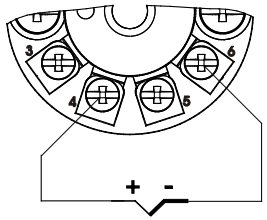
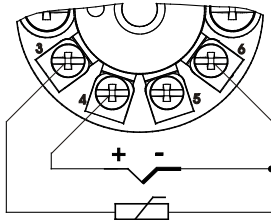
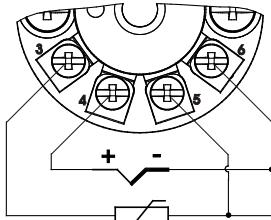


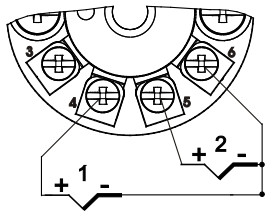
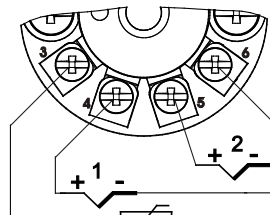
¹⁾ Line resistance to the correction can be programmed



¹⁾ Line resistance to the correction can be programmed

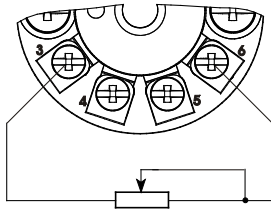
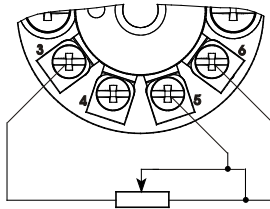
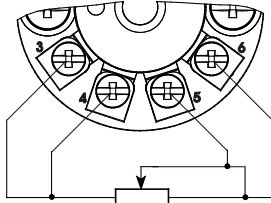
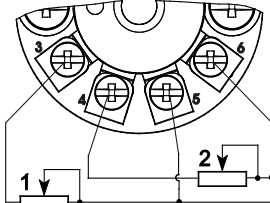
Thermocouples

Cold junction compensation		
		
Internal	With external Pt100 in two-wire input ¹⁾	With external Pt100 in three-wire input

Determination of mean value, difference, or redundancy	
	
With internal cold junction compensation	Cold junction compensation with external Pt100 in two-wire input ¹⁾

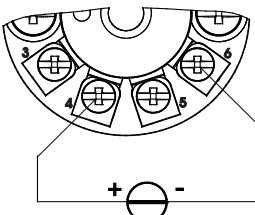
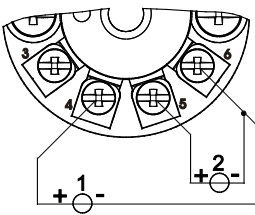
¹⁾ Line resistance to the correction can be programmed

Resistance

Resistance	
	
Two-wire input ¹⁾	Three-wire input
	
Four-wire input	<p>Determination of mean value, difference, or redundancy</p> <ul style="list-style-type: none"> • 1 resistance in two-wire input ¹⁾ or • One resistance in three-wire input

¹⁾ Line resistance for the correction can be programmed

Voltage measurement

Voltage measurement	
	
A power supply	Measuring mean value, difference, and redundancy using two power supplies

5.4 Bus connection

Bus installation

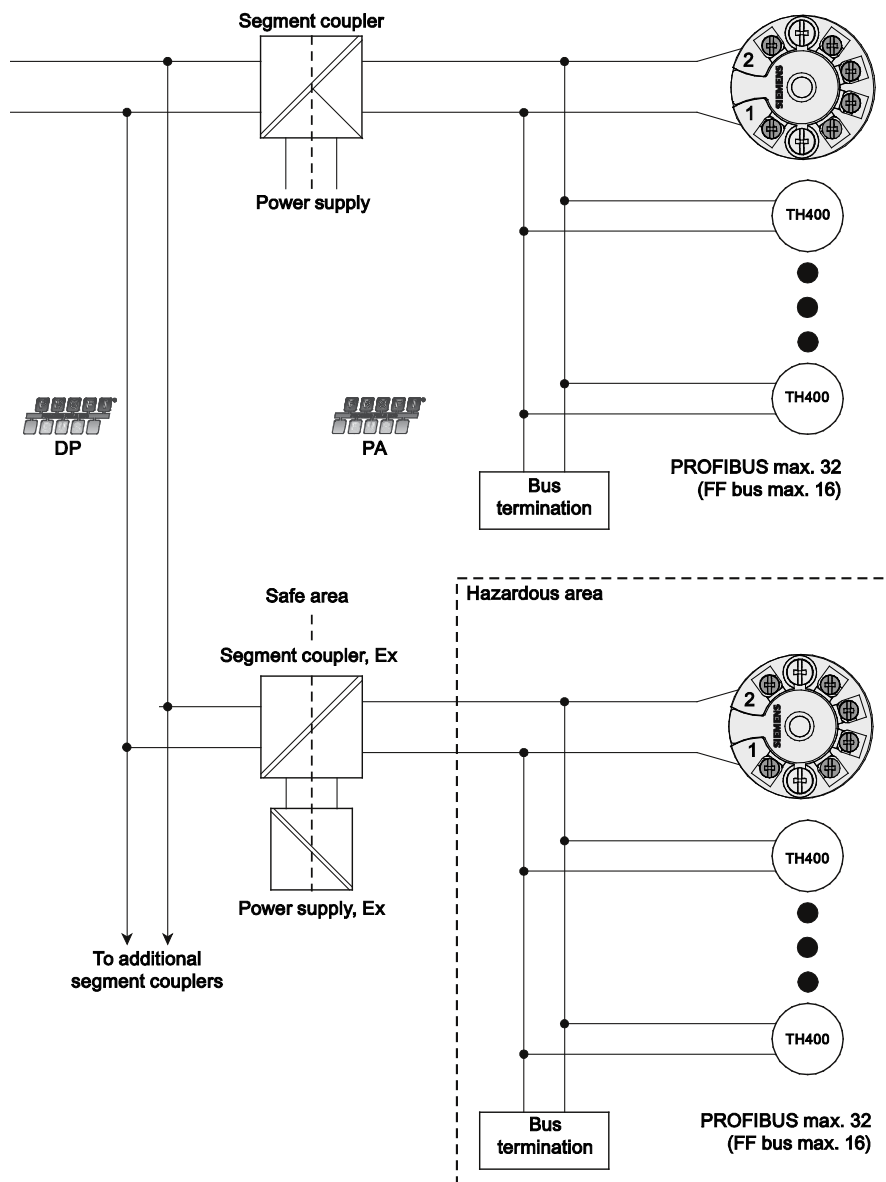


Figure 5-2 Bus installation using PROFIBUS PA as an example. The FOUNDATION Fieldbus should be connected correspondingly.

Bus connection

Connect the transmitter with its terminals "1" and "2" to the segment coupler. The transmitter acts independent of polarity.

Operation

Operator control options

You can operate the transmitter over PROFIBUS PA or FOUNDATION Fieldbus.

Operation via PROFIBUS PA

In order to configure or operate the transmitter, you require a PC/PG with SIMATIC PDM, V6.0 or later. The following documentation contains all information relevant to operation via PROFIBUS PA:

- Manual
"SIMATIC The Process Device Manager" 05/2008
- Configuration manual
"Temperature measuring instruments SITRANS TH400 PROFIBUS® PA",
Configuration manual 02/2007,
Order No. A5E01039143

Operation via FOUNDATION Fieldbus

You require the following equipment to operate or configure the device:

- A PC/PG with appropriate engineering software, e.g. "Emerson AMS"
- Alternative: Handheld 375

All information you require to use the equipment can be found in the respective documentation.

The following documentation contains all information required for operation with FOUNDATION Fieldbus:

- Configuration manual
"Temperature measuring instruments SITRANS TH400 FOUNDATION™ Fieldbus",
Configuration manual 02/2007,
Order No. A5E01039144.

Additionally applicable documents

Information on application-specific operation is available in the following sources:

- The PROFIBUS PA/FOUNDATION Fieldbus configuration manuals are part of the "SITRANS T - temperature transmitters" CD (available separately, Order No. A5E00364512).

In addition, you can find the manuals referred to above on the Internet at:

- Configuration manuals:

Instructions and manuals

(<http://www.siemens.com/processinstrumentation/documentation>)

- SIMATIC PDM:

SIMATIC PDM Instructions and Manuals

(<http://support.automation.siemens.com/WW/llisapi.dll?aktprim=0&lang=en&referer=%2fWW%2f&func=cslib.csinfo&siteid=csius&treeLang=de&groupid=4000002&extranet=standard&viewreg=WW&nodeid0=10806857&objaction=csopen>)

Information on operation of other engineering software or on the used handheld can be found in the respective documentation.

Functions

7.1 Summary

You can find detailed information about the software of the SITRANS TH400 - PA/FF for PROFIBUS PA or FOUNDATION fieldbus in the following Programming Manual:

- SITRANS TH400 PROFIBUS PA: Configuration manual, document number A5E01039143;
- SITRANS TH400 FOUNDATION field bus: Configuration manual, document number A5E01039144.

You can find both documents on the "SITRANS T - temperature transmitters" CD, ordered separately, order number A5E00364512 or on the Internet at www.siemens.de/sitranst.

7.2 Device address

7.2.1 SITRANS TH400 PROFIBUS PA

Note

- Before operating two or more field devices, make sure that the device addresses are set on the bus.
 - Assign each address only once, so that the addresses are allocated uniquely.
-

- The address range is from 1 to 125.
- From the warehouse, the SITRANS TH400-PA is set to the address 126.
- Normally in the PROFIBUS PA systems the masters are assigned the lower addresses.
- Begin the address assignment at 30.

7.2.2 SITRANS TH400 FOUNDATION field bus

Note

- The following points are necessary for the SITRANS TH400-FF to function properly:
 - a unique node address;
 - a physical device identifier for the fieldbus.
 - The node address must be unique within the link (segment), while the physical device identifier must be unique within the entire network.
-
- When delivered, the SITRANS TH400-FF has a unique physical device identifier.
 - The device identifier is a concatenation of the string "SITRANS TH400" and part of the serial number.
 - The node address is set to "22".
 - In the unit configuration, set the node address to a value that is unique within the link.
 - To avoid address conflicts, the SITRANS TH400-FF automatically sets its address to one of the temporary standard addresses between 248 and 251 as soon as it recognizes another device with the same node address.

7.3 Device delivery condition

The device parameters of the SITRANS TH400 - PA/FF are set to default values. You will find the default settings in the relevant "Configuration Manuals".

When the SITRANS TH400 is delivered, the following parameters are set differently from the default assignment:

Parameter	Set value
SITRANS TH400-PA (7NG3214)	
Break monitoring, channel 1	ON
Short circuit monitoring, channel 1	OFF
SITRANS TH400-FF (7NG3215)	
Break monitoring, channel 1	ON
Short circuit monitoring, channel 1	OFF

Excerpt of important default values for SITRANS TH400-PA and SITRANS TH400-FF	
Sensor	Pt100 (IEC)
Connection type	Three-wire input
Unit	°C
Failure behavior	Last valid value
Filter time	0 s

Excerpt of important default values for SITRANS TH400-PA and SITRANS TH400-FF		
Only for SITRANS TH400-PA devices		
	PA address	126
	PROFIBUS identification number	Manufacturer-specific
Only for SITRANS TH400-FF devices		
	Node address	22

7.4 Simulation mode

7.4.1 Simulation mode in PROFIBUS PA

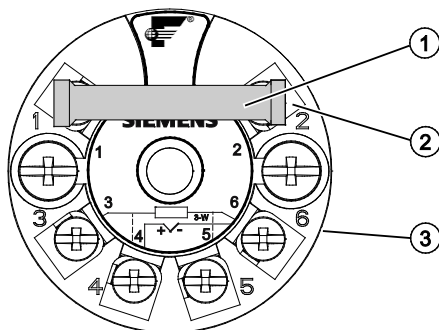
The simulation mode of the PROFIBUS PA has no simulation write protection.

7.4.2 Simulation mode with FOUNDATION fieldbus

Note

- To use the simulation mode in SITRANS TH400 FOUNDATION fieldbus you need a special magnetic pin to enable the software simulation mode.
 - You can obtain this magnetic pin from technical support in the Internet at <http://www.siemens.de/automation/support-request>.
-

- To switch to the software simulation mode in the SITRANS TH400 FOUNDATION fieldbus version, place to the connecting terminals 1 and 2 on the special magnetic pin; see the following picture.



- ① Magnetic pin
- ② Connecting terminal
- ③ SITRANS TH400 FF

Figure 7-1 Activation of reed contact in SITRANS TH400 FF

- As long as the device is operated in simulation mode, the magnetic pin must be located on the device.

Service and maintenance

8.1 Maintenance

The device is maintenance-free. However, a periodic inspection according to pertinent directives and regulations must be carried out.

An inspection can include check of:

- Ambient conditions
- Seal integrity of the process connections, cable entries, and cover screws
- Reliability of power supply, lightning protection, and grounds

WARNING

Impermissible repair and maintenance of the device

- Repair and maintenance must be carried out by Siemens authorized personnel only.

WARNING

Impermissible repair of explosion protected devices

Danger of explosion in areas subject to explosion hazard.

- Repair must be carried out by Siemens authorized personnel only.

Cleaning the enclosure

- Clean the outside of the enclosure and the display window using a cloth moistened with water or a mild detergent.
- Do not use aggressive cleaning agents or solvents. Plastic components or painted surfaces could be damaged.

WARNING

Electrostatic charge

Danger of explosion in hazardous areas if electrostatic charges develop, for example, when cleaning plastic enclosures with a dry cloth.

- Prevent electrostatic charging in hazardous areas.

Technical data

Input

Measurement rate of the analog-to-digital conversion	< 50 ms
Resolution of the analog-to-digital conversion	24 Bit

Resistance thermometer and linear resistance input:

Resistance thermometer	Min. value	Max. value	Standard
Pt25 ... Pt1000	-200°C	+850°C	IEC60751/JIS C 1604
NI25 ... Ni1000	-60°C	+250°C	DIN 43760
Cu10 ... Cu1000	-50°C	+200°C	$\alpha = 0.00427$

Line resistance per sensor cable	Max. 50 Ω
Sensor current	Nominal 0.2 mA

Sensor fault recognition

Sensor break recognition	Yes
Sensor short circuit recognition	Yes
Short circuit recognition	< 15 Ω

Input of resistance-type transmitter

Resistance-type transmitter	Min. value	Max. value
Resistance-type transmitter	0 Ω	10 k Ω

Line resistance per sensor cable	Max. 50 Ω
Sensor current	Nominal 0.2 mA

Sensor fault recognition

Sensor break recognition	Yes
Sensor short circuit recognition	Yes
Short circuit recognition	< 15 Ω

Thermocouple input:			
Type	Min. value	Max. value	Standard
B	+400°C	+1820°C	IEC584
E	-100°C	+1000°C	IEC 584
J	-100°C	+1000°C	IEC 584
K	-100°C	+1200°C	IEC 584
L	-200°C	+900°C	DIN 43710
N	-180°C	+1300°C	IEC 584
R	-50°C	+1760°C	IEC 584
S	-50°C	+1760°C	IEC 584
T	-200°C	+400°C	IEC 584
U	-200°C	+600°C	DIN 43710
W3	0°C	+2300°C	ASTM E988-90
W5	0°C	+2300°C	ASTM E988-90
External cold junction compensation	-40°C	+135°C	IEC 60751

Sensor fault recognition	
Sensor break recognition	Yes
Sensor short circuit recognition	Yes
Short circuit recognition	< 3 mV
Sensor current in case of break monitoring	4 µA

Millivolt transmitter - voltage input	
Measuring range	-800 ... +800 mV
Input resistance	10 MΩ

Output

Filter time (programmable)	0 ... 60 s
Updating time	< 400 ms

Output response in event of sensor fault		
Selectable function	Value output	Status output
Output last valid value	Last valid value	Unsure
Output safety value	Selected safety value	Unsure
Output incorrectly calculated value	Incorrectly calculated value	Bad

Power supply

Supply voltage:	
Standard	DC 9.0 ... 32 V
Power consumption	< 11 mA
Max. increase of power consumption in case of fault	< 7 mA

Ambient condition

Note

Ambient conditions in hazardous areas

The ambient temperatures specified under "Approvals and certificates" in the section "Technical data" apply to use in hazardous areas.

Permissible ambient temperature	-40 ... +85°C (-40 to +185°F)
Permissible storage temperature	-40 ... +85°C (-40 to +185°F)
Relative humidity	≤ 98%, condensing

Dielectric strength

Test voltage	AC 500 V for 60 s
Continuous operation	AC 50 V/DC 75 V

Mechanical testing

Vibrations (DIN class B)	IEC 60068-2-6 and IEC 60068-2-64 4 g/2 ... 100 Hz
--------------------------	--

Measuring accuracy

The accuracy is defined as the higher value of **general values** and **basic values**.

General values		
Input type	Absolute accuracy	Temperature coefficient
All	±0.05% of measured value	±0.002% of measured value / °C

Basic values		
Input type	Basic accuracy	Temperature coefficient
Pt100 and Pt1000	$\leq \pm 0.1^\circ\text{C}$	$\leq \pm 0.002^\circ\text{C} / ^\circ\text{C}$
Ni100	$\leq \pm 0.15^\circ\text{C}$	$\leq \pm 0.002^\circ\text{C} / ^\circ\text{C}$
Cu10	$\leq \pm 1.3^\circ\text{C}$	$\leq \pm 0.02^\circ\text{C} / ^\circ\text{C}$
Resistance-type transmitter	$\leq \pm 0.05 \Omega$	$\leq \pm 0.002 \Omega / ^\circ\text{C}$
Voltage sensor	$\leq \pm 10 \mu\text{V}$	$\leq \pm 0.2 \mu\text{V} / ^\circ\text{C}$
Thermocouple type: E, J, K, L, N, T, U	$\leq \pm 0.5^\circ\text{C}$	$\leq \pm 0.010^\circ\text{C} / ^\circ\text{C}$
Thermocouple type: B, R, S, W3, W5	$\leq \pm 1^\circ\text{C}$	$\leq \pm 0.025^\circ\text{C} / ^\circ\text{C}$
Cold junction compensation	$< \pm 0.5^\circ\text{C}$	
Reference conditions		
• Heat-up time		30 s
• Signal-to-noise ratio		Min. 60 dB
• Calibration condition		20 ... 28°C

EMC

Regulations observed	Standard
EMC 2004/108/EC Emission and interference immunity	EN 61326

EMC of interference voltage influence	$< \pm 0.1\%$ of the measuring span
Extended EMC interference immunity: NAMUR NE 21, criterion A, burst	$< \pm 1\%$ of the measuring span

Construction

Dimensions	$\varnothing 44 \times 26.3 \text{ mm}$
Degree of protection (transmitter housing/terminal)	IP40/IP00
Weight	55 g

Certificates and approvals: *Explosion protection ATEX and further approval authorities*

ATEX Zone 0 and 1 approvals	SITRANS TH400 7NG3214-0AN00
	SITRANS TH400 7NG3215-0AN00
<i>Explosion protection ATEX and further approval authorities</i>	
Only the technical data listed in the certificates, e.g. KEMA 06 ATEX 0264, applies to applications in hazardous areas.	
"Intrinsic safety" protection type	<ul style="list-style-type: none"> • II 1 G Ex ia IIC T4...T6 • II 2(1) G Ex ib[ia] IIC T4...T6 • II 1 D Ex iaD

Electrical specifications				
	Intrinsically-safe power supply		Application in FISCO systems	
	With $P_o < 0.84$ W	With $P_o < 1.3$ W	With $U_o = 17.5$ V	With $U_o = 15$ V
Input parameters: Terminals 1 and 2				
U_i	30 V	30 V	17.5 V	15 V
I_i	120 mA	300 mA	250 mA	900 mA
P_i	0.84 W	1.3 W	2.0 W	5.32 W
L_i	1 μ H	1 μ H	1 μ H	1 μ H
C_i	2.0 nF	2.0 nF	2.0 nF	2.0 nF
Output parameters: Terminals 3, 4, 5, and 6				
U_o	5.7 V			
I_o	8.4 mA			
P_o	12 mW			
L_o	200 mH			
C_o	40 μ F			
Permissible ambient temperature				
Temperature class T1 ... T4	-40 ... +85 °C	-40 ... +75 °C	-40 ... +85 °C	-40 ... +85 °C
Temperature class T5	-40 ... +70 °C	-40 ... +65 °C	-40 ... +60 °C	-40 ... +60 °C
Temperature class T6	-40 ... +60 °C	-40 ... +45 °C	-40 ... +45 °C	-40 ... +45 °C

ATEX Zone 2 approvals	SITRANS TH400 7NG3214-0NN00
	SITRANS TH400 7NG3215-0NN00
<i>Explosion protection ATEX and further approval authorities</i>	
Only the technical data listed in the certificates, e.g. KEMA 06 ATEX 0263 X, applies to applications in hazardous areas.	

ATEX Zone 2 approvals	SITRANS TH400 7NG3214-0NN00 SITRANS TH400 7NG3215-0NN00
Types of protection for Zone 2 applications	<ul style="list-style-type: none"> • II 3 GD Ex nA[nL] IIC T4...T6 • II 3 GD Ex nL IIC T4...T6 • II 3 GD Ex nA[ic] IIC T4...T6 • II 3 GD Ex ic IIC T4...T6
Permissible ambient temperature	
Temperature class T1 ... T4	-40 ... +85 °C
Temperature class T5	-40 ... +75 °C
Temperature class T6	-40 ... +60 °C
Input parameters: Terminals 1 and 2 in the degree of protection "nA"	
U _i	32 V
Input parameters: Terminals 1 and 2 in the type of protection "nL" or "ic"	
U _i	32 V
L _i	1 µF
C _i	2.0 nF
Input parameters: Terminals 1 and 2 in the degree of protection "nL" FNICO	
U _i	17.5 V
L _i	1 µH
C _i	2.0 nF
Output parameters: Terminal 3, 4, 5, and 6 for connecting thermocouples and resistance thermometers in the types of protection "nA", "nL" and "ic":	
U _o	5.7 V
I _o	8.4 mA
P _o	12 mW
L _o	200 mH
C _o	40 µF

Certificates and approvals: FM for USA

FM approvals for USA ¹⁾	SITRANS TH400 7NG3214-0AN00 SITRANS TH400 7NG3215-0AN00	SITRANS TH400 7NG3214-0NN00 SITRANS TH400 7NG3215-0NN00
FM 3027985	<ul style="list-style-type: none"> • IS Class I, Div 1, Groups A, B, C, D T4/T5/T6, FISCO • IS Class I, Zone 0, AEx ia, IIC T4/T5/T6, FISCO • NI Class I, Div 2, Groups A, B, C, D T4/T5/T6, FNICO 	<ul style="list-style-type: none"> • NI Class I, Div 2, Groups A, B, C, D T4/T5/T6, FNICO

- 1) The complete parameters (entity) and rated conditions can be found in the FM certificate of compliance no. 3027985 and the installation drawing A5E01002219 A.

Certificates and approvals: *cCSAus for Canada*

cCSAus approvals for Canada ¹⁾	SITRANS TH400 7NG3214-0AN00	SITRANS TH400 7NG3214-0NN00
	SITRANS TH400 7NG3215-0AN00	SITRANS TH400 7NG3215-0NN00
cCSAus 1861385	<ul style="list-style-type: none"> IS Class I, Div 1, Groups A, B, C, D T4/T5/T6 Ex ia IIC T4/T5/T6 and Ex ib [ia] IIC T4/T5/T6 	<ul style="list-style-type: none"> NI Class I, Div 2, Groups A, B, C, D T4/T5/T6 Ex nA II T4/T5/T6

- 1) The complete parameters (entity) and rated conditions can be found in the CSA certificate of compliance no. 1861385 and the installation drawing A5E01002219 A.

Parameter assignment interface

PROFIBUS PA connection:	
PROFIBUS PA protocol	A&D profile, ver. 3.0
PROFIBUS PA protocol standard	EN 50170 vol. 2
PROFIBUS PA address (on delivery)	126
PROFIBUS PA function blocks	Two analog
FOUNDATION fieldbus connection	
FOUNDATION fieldbus protocol	FF protocol
FOUNDATION fieldbus protocol standard	FF design regulations
FOUNDATION fieldbus functionality	Basic or LAS
FOUNDATION fieldbus version	ITK 4.6
FOUNDATION fieldbus function blocks	Two analog and one PID

Dimension drawings

Dimension drawing for SITRANS TH400

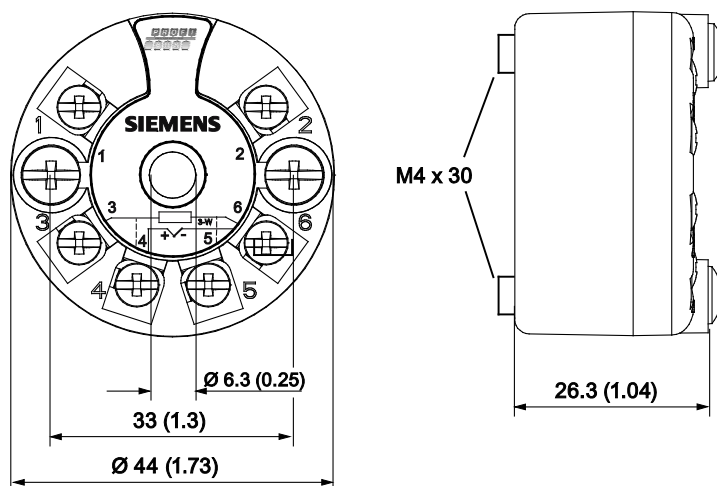


Figure 10-1 SITRANS TH400 dimensions

Note

The dimensions hold for SITRANS TH400 PROFIBUS PA and SITRANS TH400 FOUNDATION fieldbus.

Spare parts and accessories

Transmitter

Designation		Order No.
	SITRANS TH400 temperature transmitter for installation in the connection head, with electrical isolation; operating instructions must be ordered separately.	
	Bus capability for PROFIBUS PA	
	Without explosion protection or Zone 2 / DIV2 applications in accordance with ATEX, FM and CSA	7NG3214-0NN00
	With explosion protection, "Intrinsic safety" type of protection in accordance with ATEX, FM and CSA	7NG3214-0AN00
	Bus capability for FOUNDATION Fieldbus	
	Without explosion protection or Zone 2 / DIV2 applications in accordance with ATEX, FM and CSA	7NG3215-0NN00
	With explosion protection, "Intrinsic safety" type of protection in accordance with ATEX, FM and CSA	7NG3215-0AN00
	Further versions Add "-Z" to Order No., specify Order code, and add plain text.	Order code
	Setting of customized operating data (specify in plain text)	Y01 ¹⁾
	With test report (5 measuring points)	C11 ²⁾

1) Y01: Specify all data which deviate from the factory settings (see below).

2) Can only be ordered together with Y01 (specification of measuring range is essential).

Accessories

Designation		Order No.
	CD for temperature measuring instruments containing documentation in German/English/French/Spanish/Italian/Portuguese and the SIPROM T parameterization software	A5E00364512
	DIN rail adapter for head transmitter (order quantity: 5 units)	7NG3092-8KA
	4-core cable, 150 mm, for connection of sensor with head transmitter in high hinged cover (set with five units)	7NG3092-8KU

Factory settings

Designation	Factory settings
SITRANS TH400 PA	
Sensor	Pt100 (IEC 751) in 3-wire input
Unit of measurement	°C
Response in event of failure	Last valid value
Filter time	0 s
PA address	126
PROFIBUS ID No.	Manufacturer-specific
SITRANS TH400 FF	
Sensor	Pt100 (IEC 751) in 3-wire input
Unit of measurement	°C
Response in event of failure	Last valid value
Filter time	0 s
Node address	22

Further information

All Instructions, catalogs and certificates for SITRANS T can be obtained from the following Internet address: Product information on SITRANS T on the Internet (<http://support.automation.siemens.com/WW/llisapi.dll?func=cslib.csinfo&nodeid0=10806857&lang=en&siteid=csius&aktprim=0&extranet=standard&viewreg=WW&objid=10806943&treeLang=en>)

See also

Product information on SITRANS T on the Internet (<http://support.automation.siemens.com/WW/llisapi.dll?func=cslib.csinfo&nodeid0=10806857&lang=en&siteid=csius&aktprim=0&extranet=standard&viewreg=WW&objid=10806943&treeLang=en>)

Appendix

A.1 Certificates / EC declaration of conformity

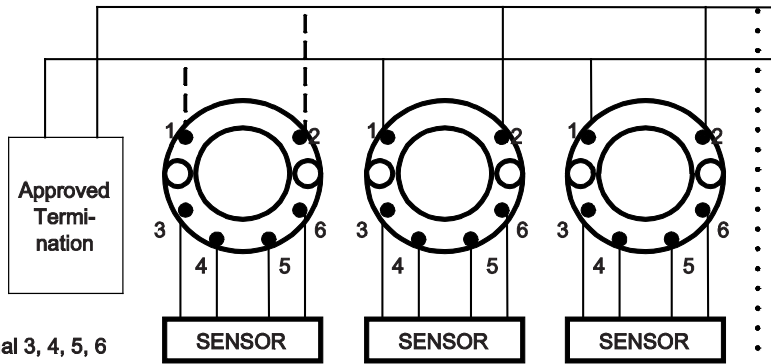
You can find the certificates and the EC declaration of conformity on the "SITRANS T - temperature transmitters" CD (available separately, Order No. A5E00364512), and on the Internet.

A.2 Control drawing

Model SITRANS TH 400
7NG321*-0AN00
Hazardous (Classified) Location

Class I, Division 1, Groups, A, B, C, D

Class I, Zone 0, IIC



Non-hazardous Location

**Associated Apparatus
Barrier or
FISCO Supply
with
entity Parameters:**

$UM \leq 250\text{ V}$
 $V_{oc} \text{ or } U_o \leq V_{max} \text{ or } U_i$
 $I_{sc} \text{ or } I_o \leq I_{max} \text{ or } I_i$
 $P_o \leq P_i$
 $C_a \text{ or } C_o \geq C_i + C_{cable}$
 $L_a \text{ or } L_o \geq L_i + L_{cable}$

This device must not be connected to any associated apparatus which uses or generates more than 250 VRMS

Terminal 3, 4, 5, 6
 $V_t \text{ or } U_o : 5,71\text{ V}$
 $I_t \text{ or } I_o : 8,4\text{ mA}$
 $P_t \text{ or } P_o : 12\text{ mW}$
 $C_a \text{ or } C_o : 40\text{ uF}$
 $L_a \text{ or } L_o : 200\text{ mH}$

Terminal 1,2				
Class I, Zone 0, Ex ia IIC, Entity / FISCO				
IS, Class I, 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:	$T_a \leq +85^\circ\text{C}$	$T_a \leq +75^\circ\text{C}$	$T_a \leq +85^\circ\text{C}$	$T_a \leq +85^\circ\text{C}$
T5:	$T_a \leq +70^\circ\text{C}$	$T_a \leq +65^\circ\text{C}$	$T_a \leq +60^\circ\text{C}$	$T_a \leq +60^\circ\text{C}$
T6:	$T_a \leq +60^\circ\text{C}$	$T_a \leq +45^\circ\text{C}$	$T_a \leq +45^\circ\text{C}$	$T_a \leq +45^\circ\text{C}$
$V_{max} \text{ or } U_i$	30 V	30 V	17.5 V	15 V
$I_{max} \text{ or } I_i$	120 mA	300 mA	250 mA	900 mA
P_i	0.84 W	1.3 W	2.0 W	5.32W
C_i	2.0 nF	2.0 nF	2.0 nF	2.0 nF
L_i	1 μH	1 μH	1 μH	1 μH

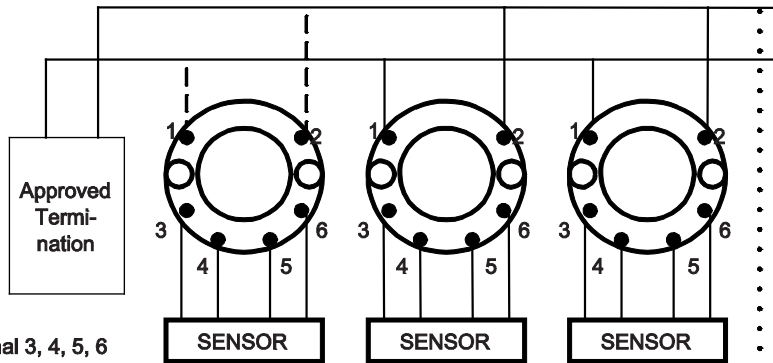
Model SITRANS TH 400
7NG321*-0AN00

Hazardous (Classified) Location

Class I, Division 2, Groups A, B, C, D

Class I, Zone 1, IIC

Non-hazardous Location



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 uF
La or Lo : 200 mH

Associated Apparatus Barrier with entity Parameters:

UM ≤ 250V
Voc or Uo ≤ Vmax or Ui
Isc or Io ≤ Imax or Ii
Po ≤ Pi
Ca or Co ≥ Ci + Ccable
La or Lo ≥ Li + Lcable
or
FISCO Supply

This device must not be connected to any associated apparatus which uses or generates more than 250 VRMS

Entity Parameters		
Terminal 1, 2		
Class I, 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 I, 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 circuit 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.

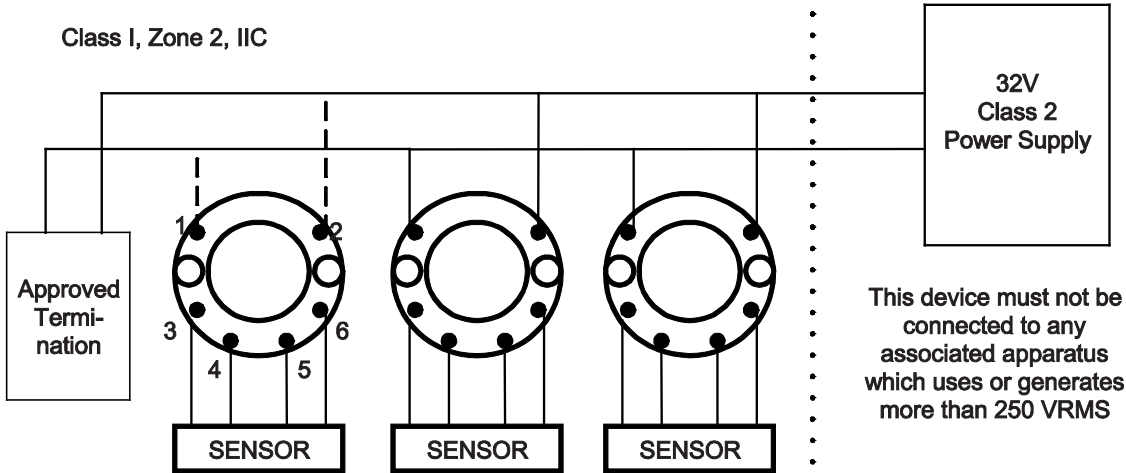
Model SITRANS TH 400
7NG321*-0NN00

Hazardous (Classified) Location

Class I, Division 2, Groups, A, B, C, D

Class I, Zone 2, IIC

Non-hazardous Location



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
 Li: 1 µH

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

A.3 Technical support

Technical Support

You can contact Technical Support for all IA and DT products:

- Via the Internet using the **Support Request**:
Support request (<http://www.siemens.com/automation/support-request>)
- E-mail (<mailto:support.automation@siemens.com>)
- **Phone:** +49 (0) 911 895 7 222
- **Fax:** +49 (0) 911 895 7 223

Further information about our technical support is available on the Internet at
Technical Support (<http://www.siemens.com/automation/csi/service>)

Industry Online Support

In addition to our documentation, we offer a comprehensive knowledge base on the Internet at:

Services & Support (<http://www.siemens.com/automation/service&support>)

There you will find:

- The latest product information, FAQs, downloads, tips and tricks.
- Our newsletter with the latest information about our products.
- A Knowledge Manager to find the right documents for you.
- Our bulletin board, where users and specialists share their knowledge worldwide.
- Your local contact partner for Industry Automation and Drives Technologies in our partner database.
- Information about field service, repairs, spare parts and lots more under "Services."

Additional Support

Please contact your local Siemens representative and offices if you have any questions about the products described in this manual and do not find the right answers.

Find your contact partner at:

Partner (<http://www.automation.siemens.com/partner>)

Documentation for various products and systems is available at:

Instructions and manuals (<http://www.siemens.com/processinstrumentation/documentation>)

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