

SIEMENS

SITRANS T

Temperature transmitter SITRANS TH100

Operating Instructions

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7NG3211-0*N00 SITRANS TH100




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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:

| |
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|  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

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.

The following table shows the most important changes in the documentation compared to each previous edition:

| Edition | Remark | Firmware identification nameplate | System integration |
|---------------|---------------------------------------|-----------------------------------|------------------------|
| 01 06/2006 | First edition | FW: 01.01.00 | TH100: SIPROM T V1.07 |
| 02 06/2010 | Editorial revision as regards content | FW: 01.01.00 | TH100: SIPROM T V1.07 |
| 03 | Not released | | |
| 04 08/2013 | Editorial revision as regards content | FW: 01.01.00 | TH100: SIPROM T V1.2.3 |

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.

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)

1.1 Conformity with European directives

The CE marking on the device symbolizes the 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 applicable directives can be found in the EC conformity declaration of the specific device.

General safety information

2

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.

| |
|--|
|  WARNING |
| Improper device modifications Danger to personnel, system and environment can result from modifications to the device, particularly in hazardous areas. <ul style="list-style-type: none">• 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, assemble, 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. <ul style="list-style-type: none">• 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".

 **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.

 **CAUTION**

Device damage due to electrical discharge

- Avoid contact with the device or electrical connections without being electrostatically discharged

Description

The SITRANS TH100 transmitter can be used in all fields. Its compact size means that it can be installed in connection heads of type B (DIN 43729) or larger. The following sensor can be connected:

- Pt100 resistance thermometer

The output signal is a load-independent direct current of 4 to 20 mA which is proportional to the temperature.

Explosion-proof transmitters can be installed and operated within potentially explosive atmospheres in compliance with the information given in the relevant certificates and approvals and in these Operating Instructions.

3.1 Product features

- Transmitter with two-wire technology
- Installation in connection head of type B (in accordance with DIN 43729) or larger, or on a DIN rail
- Programming e.g. of sensor connection and measuring range
- Intrinsically-safe and non-sparking version for use in hazardous areas

3.2 Nameplate structure

The nameplate is located on the enclosure and carries the Order No. and other important product information; see following example.

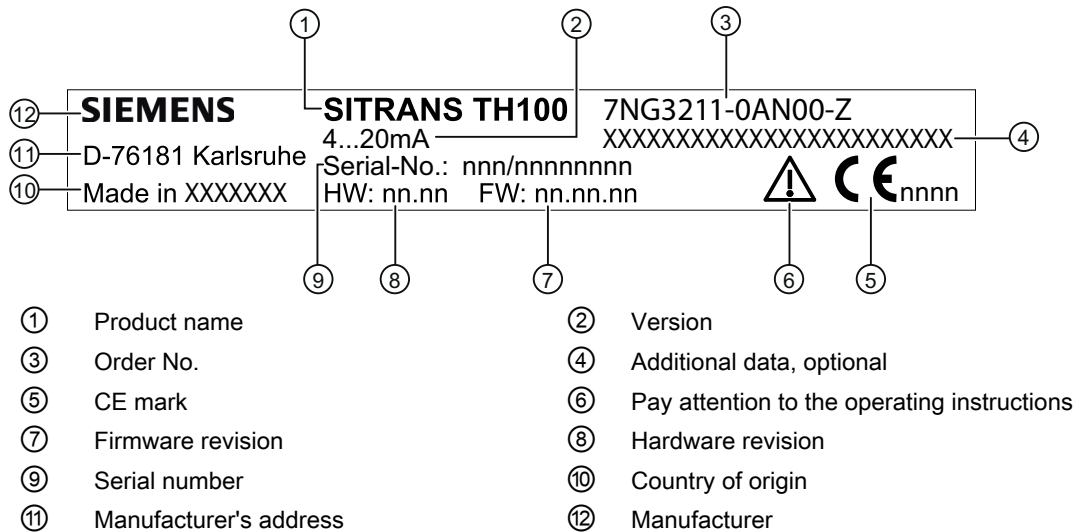


Figure 3-1 Nameplate structure

Note

Information about explosion protection

With explosion-proof devices, the information about explosion protection is noted on an additional plate on the enclosure.

Information regarding the certified types of protection can be found in Chapter Technical data (Page 31).

3.3 Mode of operation

The following function block diagram clarifies the transmitter's mode of operation:

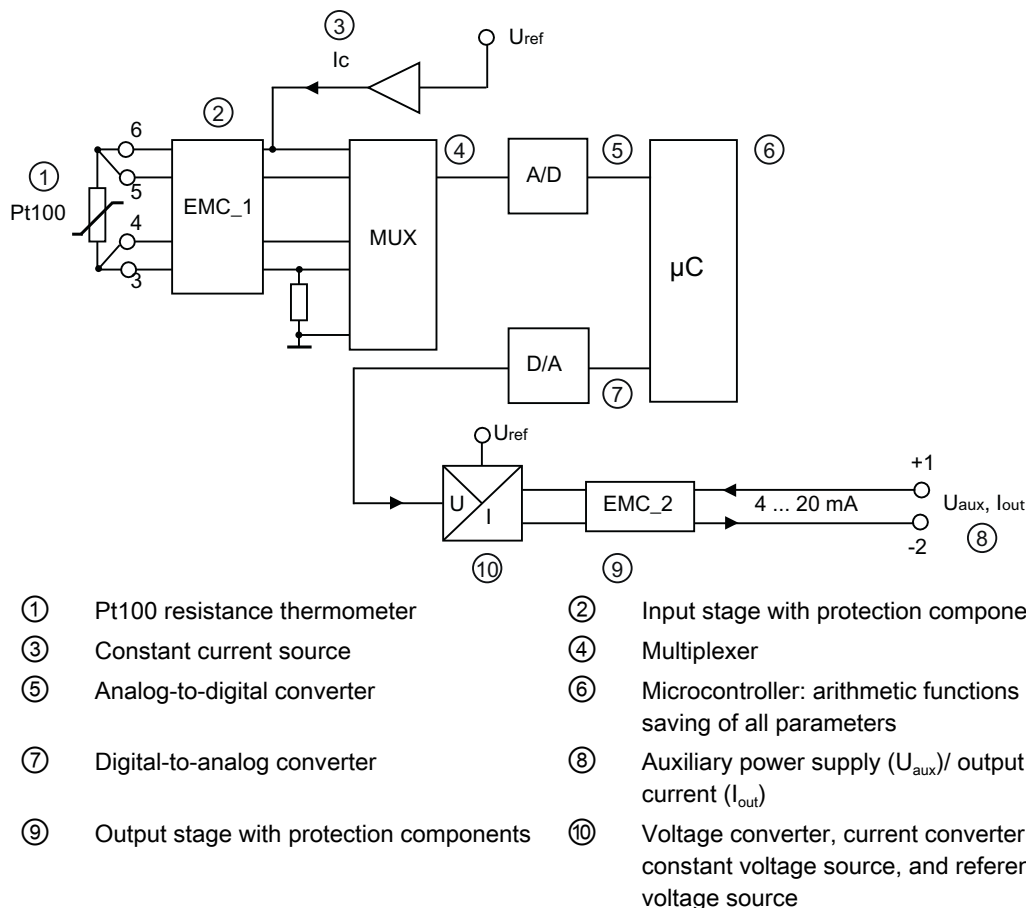



Figure 3-2 Function block diagram SITRANS TH100


Mode of operation of the transmitter

The signal delivered by a Pt100 resistance thermometer (two-wire, three-wire, four-wire system) is amplified in the input stage. The voltage proportional to the input variable is then converted into digital signals by a multiplexer in an analog-to-digital converter. These are converted in the microcontroller in accordance with the sensor characteristic and further data, e.g. measuring range or damping.

The signal prepared in this manner is then converted in a digital-to-analog converter to a load-independent direct current of 4 to 20 mA.

The input and output circuits are each protected against electromagnetic interference through the use of EMC filters.

| |
|--|
|  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 "Nameplate structure (Page 10)". |

4.1 Installation in the connection head

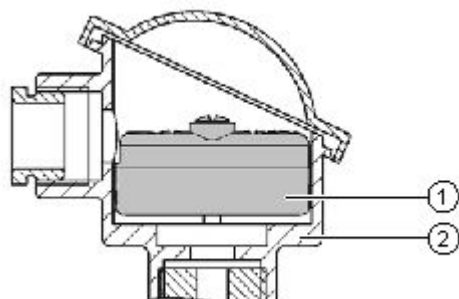
Note

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

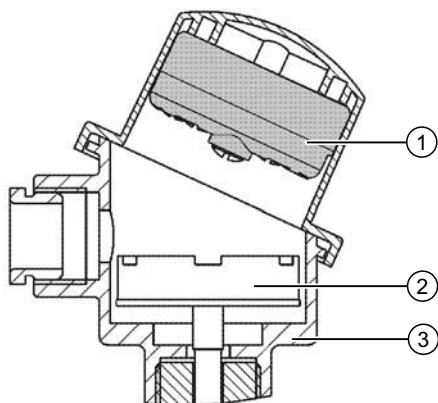
Securing the transmitter in the connection head base



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

4.2 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.

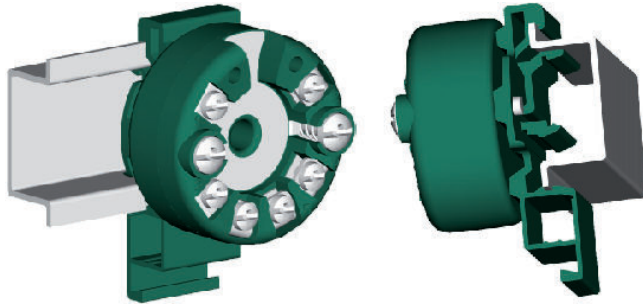



Figure 4-1 Securing the transmitter on DIN rails




Figure 4-2 Securing the transmitter on G rails

Connecting

5.1 Safety information when connecting

| |
|---|
|  WARNING |
| Connecting device in energized state Danger of explosion in hazardous areas. <ul style="list-style-type: none">• Connect devices in hazardous areas only in a de-energized state. Exceptions: <ul style="list-style-type: none">• 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 |
| Unsuitable cables and/or cable glands Danger of explosion in hazardous areas. <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. |


Note

Improvement of interference immunity

- Lay signal cables separate from cables with voltages > 60 V.
 - Use cables with twisted wires.
 - Keep device and cables distant to strong electromagnetic fields.
 - Use cables with wires that have a maximum cross-sectional area of 2.5 mm².
-

| |
|---|
| NOTICE |
| <p>Ambient temperature too high</p> <p>Damage to cable sheath.</p> <ul style="list-style-type: none"> At an ambient temperature $\geq 60\text{ }^{\circ}\text{C}$ (140 $^{\circ}\text{F}$), use heat-resistant cables suitable for an ambient temperature at least $20\text{ }^{\circ}\text{C}$ (68 $^{\circ}\text{F}$) higher. |

5.1.1 Safety notes when connecting in hazardous areas

| |
|---|
| <p> WARNING</p> |
| <p>Improper power supply</p> <p>Danger of explosion in hazardous areas as result of incorrect power supply, e.g. using direct current instead of alternating current.</p> <ul style="list-style-type: none"> Connect the device in accordance with the specified power supply and signal circuits. The relevant specifications can be found in the certificates, in Chapter "Technical data (Page 31)" or on the nameplate. |

| |
|--|
| NOTICE |
| <p>Limited range of use</p> <p>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.</p> |

Zone 0 and Zone 1 in type of protection "i" - intrinsic safety

- Only connect the transmitter, in accordance with the certificate of compliance, to devices certified as intrinsically-safe.

| | | |
|--|-----------------------|-----------------------|
| Maximum values of the auxiliary power supply and signal circuits: | | |
| $U_i = 30\text{ V DC}$ | $I_i = 100\text{ mA}$ | $P_i = 750\text{ mW}$ |
| $L_i = 106\text{ }\mu\text{H}$ | $C_i = 7.3\text{ nF}$ | |

| Maximum values of the sensor circuit: | | | | |
|---------------------------------------|------------------------|-----|-------------------------|------|
| $U_0 = 9.6 \text{ V DC}$: | $I_0 = 7.6 \text{ mA}$ | | $P_0 = 12.5 \text{ mW}$ | |
| L_0 [mH] | 50 | 10 | 2 | 0,5 |
| C_0 [nF] | 560 | 700 | 940 | 1250 |

- 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.

Zone 2 in type of protection "nL"

- 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 "nL" certified devices (limited energy resources) of Category 3.
- Be sure to observe the respective values.

| Maximum values of the auxiliary power supply and signal circuits: | | |
|---|------------------------|------------------------|
| $U_i = 32 \text{ V DC}$ | $I_i = 100 \text{ mA}$ | $P_i = 750 \text{ mW}$ |
| $L_i = 106 \text{ } \mu\text{H}$ | $C_i = 7.3 \text{ nF}$ | |

| Maximum values of the sensor circuit | | | | |
|--------------------------------------|------------------------|-----|-------------------------|------|
| $U_0 = 9.6 \text{ V DC}$: | $I_0 = 7.6 \text{ mA}$ | | $P_0 = 12.5 \text{ mW}$ | |
| L_0 [mH] | 50 | 10 | 2 | 0,5 |
| C_0 [nF] | 560 | 700 | 940 | 1250 |

Zone 2 in type of protection "ic"

- Only connect the transmitter to devices that have at least been approved as "ic" certified devices (intrinsically safe) of Category 3.
- Be sure to observe the respective values.

| Maximum values of the auxiliary power supply and signal circuits: | | |
|---|------------------------|------------------------|
| $U_i = 32 \text{ V DC}$ | $I_i = 100 \text{ mA}$ | $P_i = 750 \text{ mW}$ |
| $L_i = 106 \text{ } \mu\text{H}$ | $C_i = 7.3 \text{ nF}$ | |

| Maximum values of the sensor circuit | | | | |
|--------------------------------------|------------------------|-----|-------------------------|------|
| $U_0 = 9.6 \text{ V DC}$: | $I_0 = 7.6 \text{ mA}$ | | $P_0 = 12.5 \text{ mW}$ | |
| L_0 [mH] | 50 | 10 | 2 | 0,5 |
| C_0 [nF] | 560 | 700 | 940 | 1250 |

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 $U_n = 35 \text{ V DC}$.
- Take measures to ensure that the supply voltage (including transients) does not rise above 140 % of the rated voltage.

| Maximum values of the sensor circuit | | | | |
|--------------------------------------|------------------------|-----|-------------------------|------|
| $U_0 = 9.6 \text{ V DC}$: | $I_0 = 7.6 \text{ mA}$ | | $P_0 = 12.5 \text{ mW}$ | |
| $L_0 \text{ [mH]}$ | 50 | 10 | 2 | 0,5 |
| $C_0 \text{ [nF]}$ | 560 | 700 | 940 | 1250 |

Additional requirements for use in dust explosion protected areas

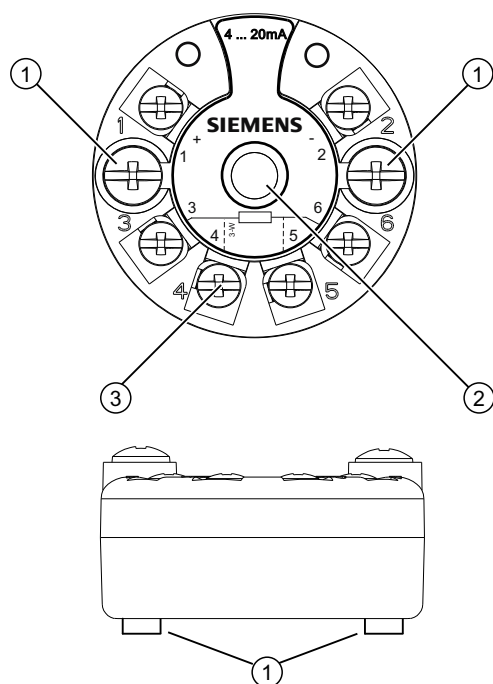
Install the transmitter in an enclosure suitable for the respective type of dust and corresponding Zone in accordance with the inspection certificate valid in your country. The enclosure shall have at least IP5x protection in accordance with IEC 60529.

5.2 Connecting the auxiliary power supply

Procedure

Connect the wires for the auxiliary power supply to terminals "1"(+) and "2"(-). Ensure that the polarity is correct. The device is reverse polarity protected.

5.3 Connector assignments



① Fixing screw M4x25

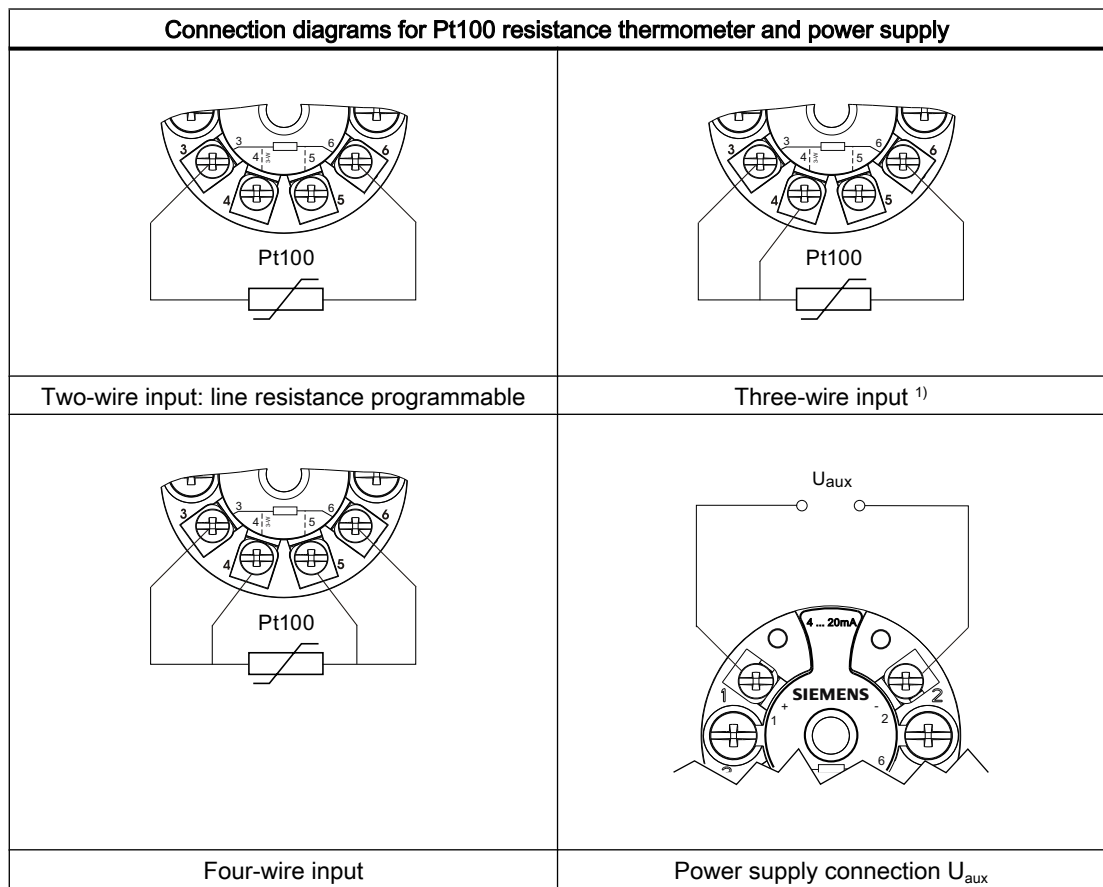
② Internal diameter of center hole 6.3 mm (0.25")

③ Fixing screws for cables 1 to 6

Connections: 1 (+) and 2 (-) Auxiliary power supply U_{aux} , output current I_{out}
 3, 4, 5, and 6 Sensor connections (Pt100)

Figure 5-1 Connector assignments SITRANS TH100

5.4 Connection diagrams



¹⁾ Terminal No. 5 has no function in the version with three-wire input, and must not be connected. When using RTDs in a version with four-wire input but when selecting a three-wire input, the cores of the unused fourth sensor line must be electrically insulated using tape.

Note**Parameter assignment**

Parameters may only be assigned to the SITRANS TH100 in the "offline" state using the parameter assignment modem and the SIPROM T operating software. Any 4 to 20 mA current loop connected to the transmitter must be disconnected before parameters are assigned.

Note**Modem**

If you already have a "Modem for SITRANS TK" (Order No. 7NG3190-6KB), you can continue to use this for parameterization of the SITRANS TH100. Connection of the SITRANS TH100 to the "Modem for SITRANS TK" is described in the modem's operating instructions.

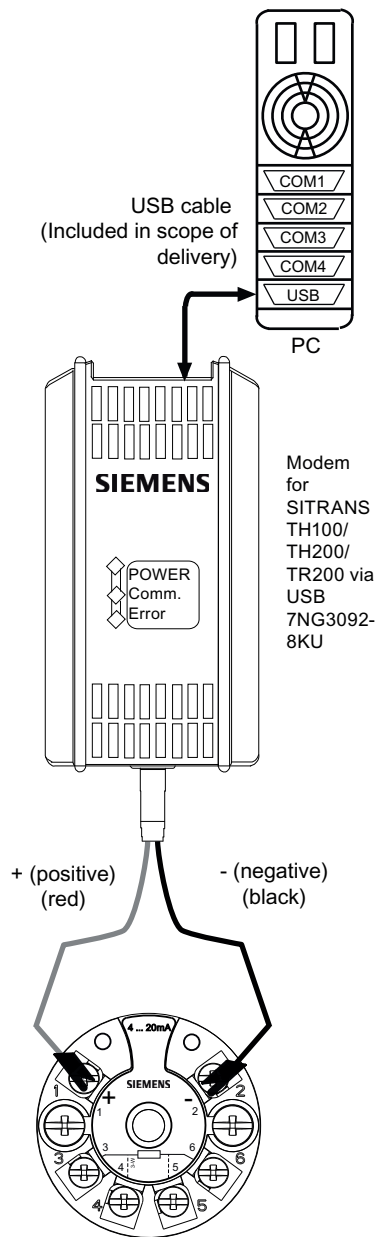
Proceed as follows

- For parameter assignment, connect the transmitter to the PC via the modem.
- Configure the transmitter using:
 - The SIPROM T parameterization software
 - The modem for SITRANS TH100/TH200
 - A PC.

The power required by the transmitter is provided via:


- The USB port of the PC if using a USB modem
- An external power adapter if using an RS232 modem

Parameter assignment to SITRANS TH100 via USB modem



For more detailed information on assigning parameters to the transmitter, refer to the operating instructions for the following products:

- Modem for SITRANS TH100/TH200/TR200 and the SIPROM T parameterization software; Order Nos.: 7NG3092-8KM and 7NG3092-8KU
- CD "SITRANS T - temperature transmitters", Order No. A5E00364512

| |
|---|
|  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. <ol style="list-style-type: none">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. |

Procedure

1. Program the transmitter's operating data according to the actual requirements.
If applicable, enter the changed operating data on the additional plate on the enclosure.
2. Assemble the transmitter.
3. Connect the sensor to the power supply, see Chapter "Connecting (Page 17)".
4. Turn on the auxiliary power supply.
5. Wait about 10 seconds. After this start-up time the transmitter is operational.

Note

Warming-up

To obtain exact measured values, the transmitter needs to be allowed to warm up for five minutes or so after the power supply has been switched on.

Functions

You can operate the SITRANS TH100 using the SIPROM T parameterization software. The following functions are available to you when operating the SITRANS TH100:

- Setting of overrange/underrange of output current
- Storage of data for identification of measuring point
- Setting of sensor connection (two-, three- or four-wire input)
- Setting of sensor offset, measuring range, unit and damping
- Setting of output current in event of fault, e.g. sensor breakage.

8.1 Output current in event of fault

The sensor lines and electronics of the transmitter are monitored continuously. In the event of a fault, the output current is set to the fault value. The fault current can be freely selected within the preset limits of the current control range of 3.6 to 23 mA.

8.2 Broken wire monitoring

All sensor lines are permanently monitored for open-circuit. The programmed fault current, 3.6 to 23 mA, is output in the event of an error. The open-circuit monitoring function cannot be deactivated.

8.5 Type of characteristic curve (rising or falling)

8.3 Short-circuit monitoring

The sensor connected to the transmitter is permanently monitored for short-circuit.

A sensor short-circuit is present if the measured resistance of the connected Pt100 becomes less than 10 Ohm.

The programmed fault current, 3.6 to 23 mA, is output in the event of a sensor short circuit.

Monitoring of the sensor short-circuit cannot be switched off.

The short-circuit limit is fixed at 10 Ohm and cannot be changed.

8.4 Line compensation

Line compensation is necessary when using the Pt100 with a 2-wire input.

The trimming is performed by numerical preset of the measured line resistance. The line resistance is the combined total of sending and return conductors.

8.5 Type of characteristic curve (rising or falling)

The type of the characteristic curve at the 4 to 20 mA analog output can be selected (rising or falling). The characteristic curve type is defined as follows by setting the parameters for the start of scale value and full scale value:

- Rising characteristic: Full scale value is greater than start of scale value.
- Falling characteristic: Full scale value is less than start of scale value.

Service and maintenance

Note

The device is maintenance-free.

Recycling

Devices described in this programming manual can be recycled.

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

Technical data

| Resistance thermometer input | |
|--|--|
| Measured variable | Temperature |
| Input type | Pt100 according to IEC 60751 |
| Characteristic curve | Linear to temperature |
| Type of connection | Two-, three- or four-wire input |
| Resolution | 14 bit |
| Measuring accuracy | |
| Span < 250 °C (450 °F) | < 0.25 °C (0.45 °F) |
| Span > 250 °C (450 °F) | < 0.1% of the span |
| Repeatability | < 0.1 °C (0.18 °F) |
| Measured current | Approx. 0.4 mA |
| Measuring cycle | < 0.7 s |
| Measuring range | -200 ... 850 °C (-328 ... 1562 °F) |
| Span | 25 ... 1050 °C (77 ... 1922 °F) |
| Unit of measurement | °C or °F |
| Offset | Programmable: -100 ... +100 °C (-180 ... 180 °F) |
| Line resistance | Max. 20 Ω (total of forward and return lines) |
| Noise suppression | 50 and 60 Hz |
| Output | |
| Output signal | 4 ... 20 mA, two-wire |
| Auxiliary power supply | 8.5 ... 36 V DC (up to 30 V with Ex ia and ib; up to 32 V with Ex nL/ic; up to 35 V with Ex nA) |
| Max. load | $(U_{aux} - 8.5 \text{ V}) / 0.023 \text{ A}$ |
| Overrange | 3.6 mA to 23 mA continuously adjustable (factory setting: 3.84 mA to 20.50 mA) |
| Error signal (e.g. in case of sensor failure) | 3.6 mA to 23 mA continuously adjustable (factory setting: 3.6 mA or 22.8 mA) |
| Damping time | 0 ... 30 s (factory setting: 0 s) |
| Protection | Against reverse polarity |
| Resolution | 12 bit |
| Accuracy at 23 °C | < 0.1% of measuring span |
| Temperature impact | Max. 0.1%/10 °C (0.1%/18 °F) |
| Influence of auxiliary power supply | < 0.01% of measuring span/V |

Output

| | |
|-------------------|---|
| Influence of load | < 0.025% of maximum span/100 Ohm |
| Long-term drift | < 0.025% of max. span in the first month < 0.035% of max. span after one year < 0.05% of max. span after five years |

Note

Measurement errors

Greater measuring errors may occur if the transmitter is installed on a DIN rail in an environment with severe interference. The applicable ESD directives must be observed.

Ambient conditions

| | |
|--|----------------------------------|
| Ambient temperature range | -40 ... +85 °C (-40 ... +185 °F) |
| Storage temperature range | -40 ... +85 °C (-40 ... +185 °F) |
| Relative humidity | ≤ 98%, condensing |
| Electromagnetic compatibility | As per EN 61326 and NAMUR NE21 |
| Errors with EMC influences | |
| ESD in accordance with EN 61000-4-2 | < 0.10% of the measuring span |
| RF irradiation in accordance with EN 61000-4-3 | < 0.4% of measuring span |
| Burst in accordance with EN 61000-4-4 | < 0.2% of measuring span |
| RF energizing in accordance with EN 61000-4-6 | < 0.3% of measuring span |

Construction

| | |
|--|---|
| Weight | 50 g |
| Dimensions | See Dimension drawing for SITRANS TH100 (Page 35) |
| Material | Plastic, potted |
| Cross-section of the connecting cables | Max. 2.5 mm ² (AWG 13) |
| Degree of protection | In accordance with IEC 60529 |
| Housing | IP40 |
| Terminals | IP00 |

Certificates and approvals

Explosion protection ATEX and further approval authorities

Only the technical data listed in the certificates, e.g. PTB 05 ATEX 2049 X, applies to applications in hazardous areas.

| | |
|---|--|
| "Gas intrinsic safety" protection type | <ul style="list-style-type: none"> • II 1 G Ex ia IIC T6/T4 Ga • II (1) 2 G Ex ib [ja Ga] IIC T6/T4 Gb • II (1) 3 G Ex ic [ja Ga] IIC T6/T4 Gc • II 3 G Ex ic IIC T6/T4 Gc |
| "Non-sparking" protection type | <ul style="list-style-type: none"> • II 3 G Ex nA IIC T6/T4 Gc • II 3 G Ex nA[ic] IIC T6/T4 Gc |
| "Dust intrinsic safety" protection type | <ul style="list-style-type: none"> • II 1 D Ex ia IIIC T115°C Da |

Protection against explosion according to FM for USA

Electrical data, operating conditions and installation instructions for operation in hazardous areas can be found in the FM Certificate of Compliance no. 3024169 as well as in the associated control drawing A5E03638596A.

- IS CI I, II, III, Div 1, GP ABCDEFG T4/T5/T6
- CI I, ZN 0 AEx ia IIC T4/T5/T6
- NI, S CI I, II, III, Div 2, GP ABCDFG T4/T5/T6
- NI IIC T4/T5/T6

Protection against explosion according to FM for Canada (cFMus)

Electrical data, operating conditions and installation instructions for operation in hazardous areas can be found in the FM Certificate of Compliance no. 3024169C as well as in the associated control drawing A5E03638596A.

- IS CI I, II, III, Div 1, GP ABCDEFG T4/T5/T6
 - CI I, ZN 0 Ex ia IIC T4/T5/T6
 - NI, S CI I, II, III, Div 2, GP ABCDFG T4/T5/T6
 - NI IIC T4/T5/T6
-

Dimensional drawings

11.1 Dimension drawing for SITRANS TH100

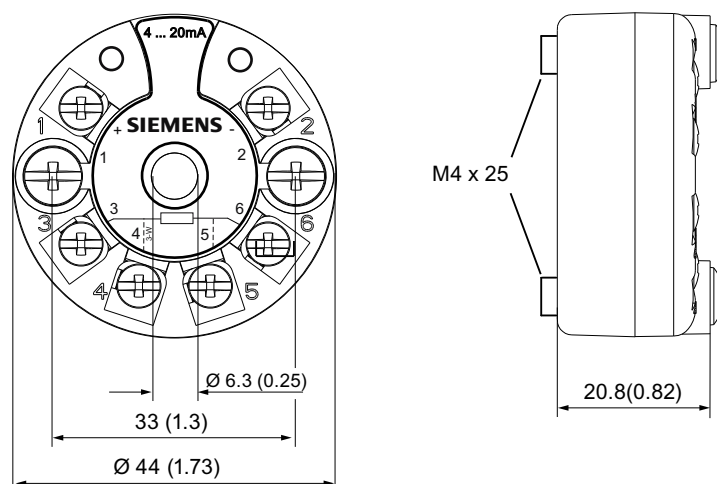


Figure 11-1 SITRANS TH100, dimensions in mm (inch)

11.2 Dimension drawing for the DIN rail adapter

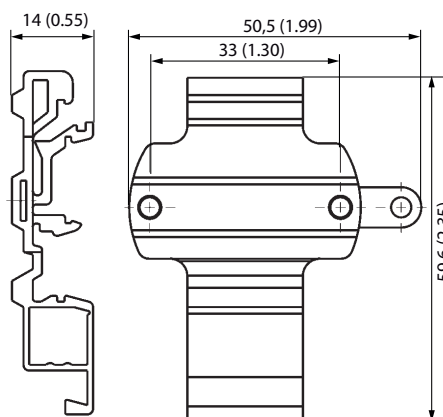


Figure 11-2 Dimensions of the DIN rail adapter (7NG3092-8KA)

Spare parts and accessories

| Designation | Order No. |
|---|--------------------------------|
| Temperature transmitter SITRANS TH100 for installation in connection head type B (DIN 43729), two-wire technology 4 to 20 mA, programmable, without electrical isolation | |
| Without explosion protection | 7NG3211-0NN00 |
| With explosion protection, type of protection "Intrinsic safety" <ul style="list-style-type: none"> • ATEX and further approval authorities • FM (cFMus) | 7NG3211-0AN00 7NG3211-0BN00 |
| Modem for SITRANS TH100 and TH200 including the SIPROM T parameterization software | |
| With USB connection | 7NG3092-8KU |
| With RS232 connection | 7NG3092-8KM |
| CD "SITRANS T - temperature transmitters" containing documentation in German/English/French/Spanish/Italian/Portuguese and the SIPROM T parameterization software | A5E00364512 |
| DIN rail adapter for head installation (packing unit = 5 units) | 7NG30920-8KA |

| Additional data Add "-Z" to Order No. and specify Order code. | Order code |
|--|------------|
| Setting of customized settings/programming (describe customized settings/programming in plain text) | Y01 |
| With test report (5 measuring points) | C11 |

Factory setting

| Pt100 (DIN IEC) | In three-wire input |
|-----------------|----------------------------|
| Measuring range | 0 to 100 °C (32 to 212 °F) |
| Fault current | 22.8 mA |
| Sensor offset | 0 °C (0 °F) |
| Damping | 0.0 s |

All Instructions, catalogs and certificates for SITRANS T can be obtained from the following Internet address: SITRANS T product information (<http://www.siemens.com/sitranst>)

Appendix

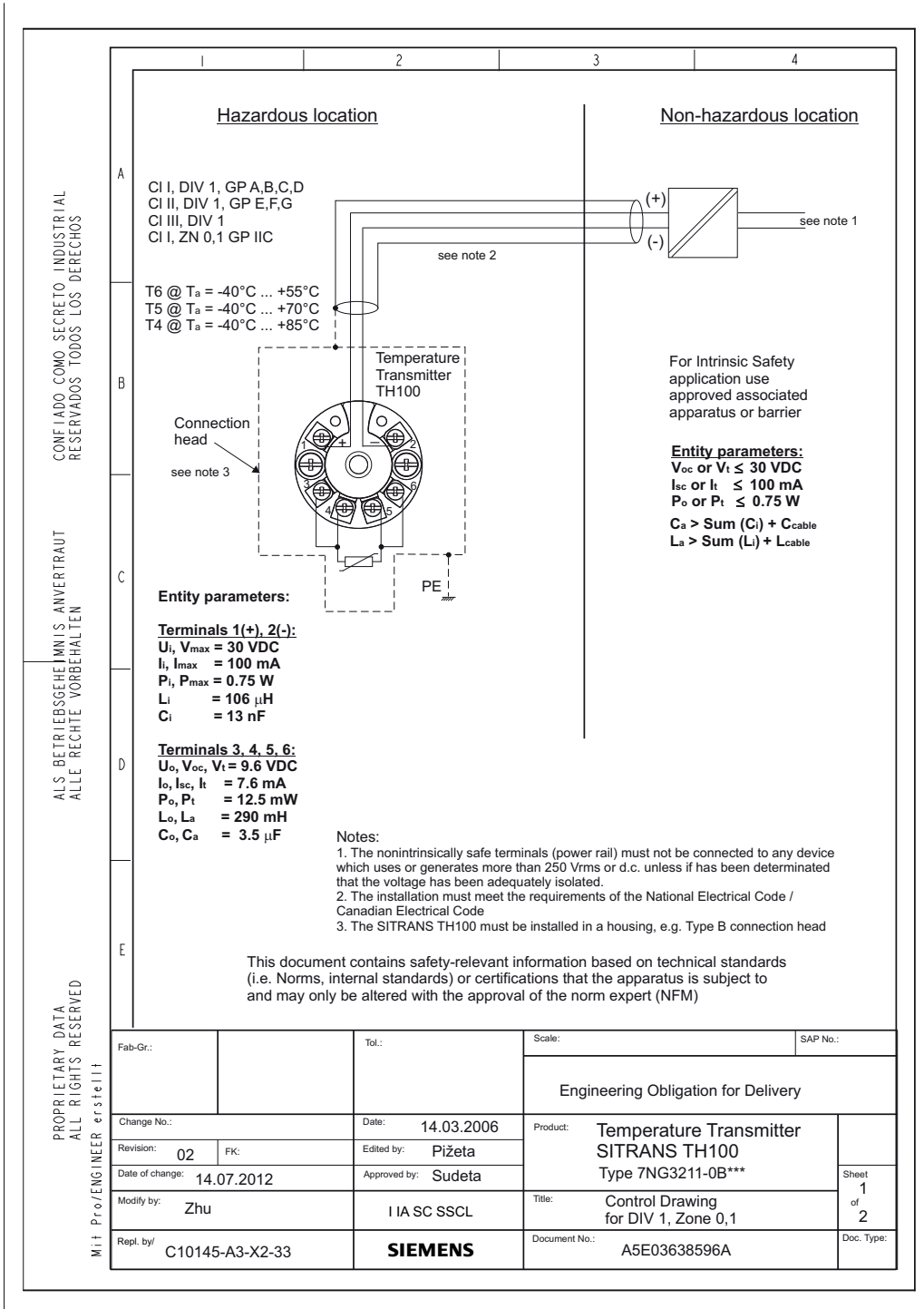
A.1 Certificates

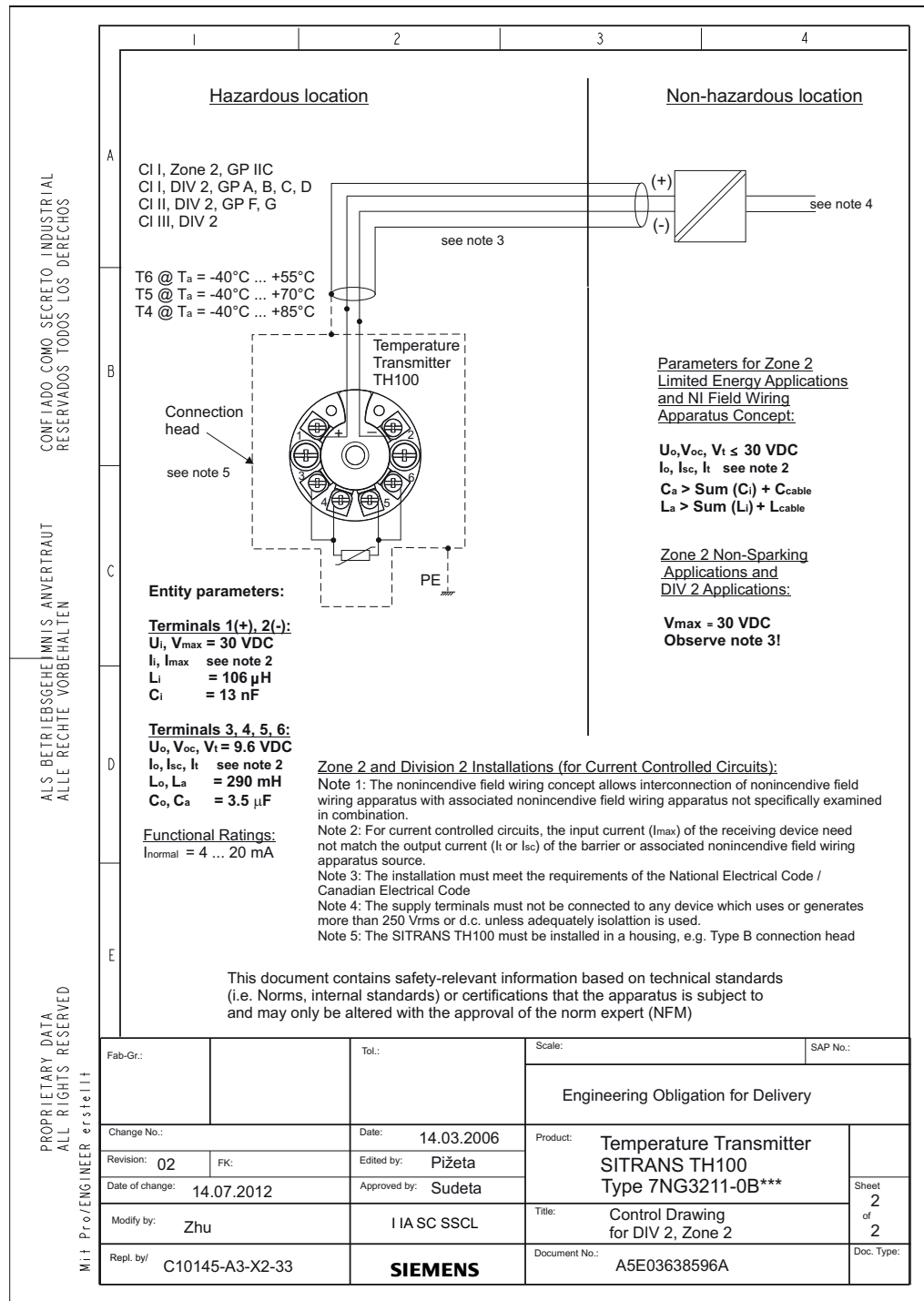
You can find the certificates on the "SITRANS T - temperature transmitters" CD, available separately, order no. A5E00364512; and on the Internet.

See also

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

A.2 Control drawing





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RESERVADOS TODOS LOS DERECHOS

ALS BETRIEBSGEHEIMNIS ANVERTRAUT
ALLE RECHTE VORBEHALTEN

PROPRIETARY DATA
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| | | | | | | | |
|-------------------------------------|-----|---------------------|--|---|--|-----------------------|--|
| Fab-Gr.: | | Tol.: | | Scale: | | SAP No.: | |
| Engineering Obligation for Delivery | | | | | | | |
| Change No.: | | Date: 14.03.2006 | | Product: Temperature Transmitter SITRANS TH100 Type 7NG3211-0B*** | | Sheet 2 of 2 | |
| Revision: 02 | FK: | Edited by: Pižeta | | | | | |
| Date of change: 14.07.2012 | | Approved by: Sudeta | | Title: Control Drawing for DIV 2, Zone 2 | | Doc. Type: | |
| Modify by: Zhu | | I IA SC SSCL | | | | | |
| Repl. by: C10145-A3-X2-33 | | SIEMENS | | Document No.: A5E03638596A | | | |

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>)

Service & Support on the Internet

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>)

Glossary

Analog

A variable which is infinitely adjustable, e.g. voltage. In contrast to "Digital".

ATEX

ATEX is the abbreviation of the French term "Atmosphère explosible". ATEX stands for the two directives of the European Community for the field of explosion protection: the ATEX product directive 94/9/EC and the ATEX operation directive 1999/92/EC.

Auxiliary power

→ *Power supply*

CE

Communautés Européenes: European communities

DC

Direct Current Direct current

Digital

Representation of a variable, e.g. time, in the form of characters or numbers. In its digital representation, this variable can be changed only in pre-defined steps. In contrast to "Analog".

DIN

Deutsches Institut für Normung e. V. (German standards association)

EC

European Community

EC low-voltage directive

The EC low-voltage directive applies to electrical equipment with rated voltages of:

- Alternating current from 50 V to 1000 V;
- Direct current from 75 V to 1500 V.

EEPROM

Electrically Erasable Programmable Read Only Memory

EEPROMs are often used where individual bytes of data (e.g. configuration data or runtime meters) change over time and must be stored safely in the event of a power failure.

EMC

Electromagnetic Compatibility

Definition in accordance with EMC law.

EMC is the capability of a device to work satisfactorily in the electromagnetic environment without causing electromagnetic interferences that are unacceptable for other devices present in this environment.

EN

Europäische Norm (European standard)

Firmware

Firmware is a type of software that is embedded in a chip in electronic devices in contrast to software proper that is stored on hard disks or other media. These days, the firmware is mostly stored in a flash memory or an EEPROM.

The firmware mostly contains elementary functions to control the device, as well as input and output routines.

IP

International Protection = international degree of protection

Microcontroller

Microcontrollers (also μ Controller, μ C, MCU) are single-chip computer systems in which almost all components such as master processor, program memory, working memory and input/output interfaces are included in a single chip.

Non-volatile memory

→ *EEPROM*

Power supply

Auxiliary power is an electrical supply or reference voltage which some electrical connections need along with the standard supply.

Auxiliary power is, for example, specially stabilized, has a special peak or polarity and/or has other characteristics that have great significance for the correct functioning of parts of the connection.

RS-232

RS: Recommended Standard

A recognized industrial standard for serial data transmission. For cable lengths shorter than 15 m. No differential evaluation. Sending and receiving on different cables.

Sensor

A sensor or (measuring) sensor is a component in technology that qualitatively records its environment or quantitatively (as a measured variable) records the material composition of its environment along with certain physical or chemical properties (e.g. heat radiation, temperature, humidity, pressure, sound or excess pressure, sound, brightness, magnetism, acceleration, power).

USB

The Universal Serial Bus (USB) is a serial bus system for connecting a PC/laptop with external devices, e.g.: Modem

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