

EN
English

Commissioning Instructions Straight thermocouples SensyTemp TSH200



Straight thermocouples SensyTemp TSH200

Commissioning Instructions - EN

CI/TSH200-EN

12.2007

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1 Safety

1.1 General Safety Information

The “Safety” chapter provides an overview of the safety aspects to be observed for the operation of the device.

The device is built based on state-of-the-art technology and is operationally safe. It was tested and left the factory in a proper state. The requirements in the manual as well as the documentation and certificates must be observed and followed in order to maintain this state for the period of operation.

The general safety requirements must be complied with completely during operation of the device. In addition to the general information, the individual chapters of the manual contain descriptions about processes or procedural instructions with specific safety information.

Only the observance of all safety information enables the optimal protection of personnel as well as the environment from hazards and the safe and trouble-free operation of the device.

1.2 Intended use

The temperature sensors are used for measuring temperature in high-temperature applications.

Repairs, alterations and enhancements or the installation of replacement parts is only permissible as far as described in the manual. Further actions must be verified with ABB Automation Products GmbH. Excluded from this are repairs performed by ABB-authorized specialist shops.

1.3 Technical limit values

The device is designed for use exclusively within the stated values on the name plate and in the technical specifications (see data sheets). These must be complied with accordingly, e.g.:

- The maximum operating temperature may not be exceeded.
- The permitted operating temperature may not be exceeded.
- The housing protection system must be observed.
- With built-in transmitter comply with the power supply.

1.4 Warranty provision

A use contrary to the device’s stipulated use, disregarding of this manual, the use of under-qualified personnel as well as unauthorized alterations excludes the manufacturer of liability from any resulting damages. The manufacturer’s warranty expires.

1.5 Operator liability

Before the use of corrosive and abrasive measuring medium, the operator must clarify the resistance of all parts that come into contact with the medium to be measured. ABB will gladly support you with the selection, however, cannot accept any liability.

The operators must strictly observe the applicable national regulations in their countries with regards to installation, function tests, repairs, and maintenance of electrical devices.

1.6 Personnel qualification

The installation, commissioning and maintenance of the device may only be carried out through trained specialist personell authorized by the plant operator. The specialist personnel must have read and understood the manual and comply with its instructions.

1.7 Information on unpacking the units

To prevent damage use the utmost care when unpacking the devices.

Check the package and packing material for accessories.

Check the devices immediately after unpacking for possible damage that may have occurred from improper transport. Damages in transit must be recorded on the transport documents. All claims for damages must be claimed without delay against the shipper and before the installation. Damaged devices may not be put into operation.

Ceramic thermowells are very fragile. Use the utmost care when unpacking and handling them. Avoid any impact or pulses. For thermometers with flanges, remove the transport lock according to the accompanying unpacking instructions.

1.8 Installation safety information

Observe the following information:

- Comply with the maximum torque for all flange connections.
- Install the devices without mechanical tension (torsion, bending).
- Install flange devices with coplanar counter flanges.
- Only install devices for the intended operating conditions and with suitable seals.
- Secure the flange bolts and nuts for pipeline vibrations.

1.9 Electrical installation safety information

The electrical connection may only be performed by authorized specialist personnel according to the electrical plans.

Comply with electrical connection information in the manual. Otherwise, the electrical protection class can be affected.

The secure separation of contact-dangerous electrical circuits is only guaranteed when the connected devices fulfill the requirements of the DIN EN 61140 (VDE 0140 Part 1) (basic requirements for secure separation).

For secure separation, run the supply lines separated from contact-dangerous electrical circuits or additionally insulate them.

1.10 Operating safety information

Before switching on, ensure that the permissible environmental conditions (see data sheets) are complied with and that, with built-in transmitter, the power supply voltage corresponds to the voltage of the transmitter.

When there is a chance that safe operation is no longer possible, put the device out of operation and secure against unintended operation.

2 Use in safety-related systems acc. to IEC61508 / IEC61511 (SIL)

Temperature sensors in the SensyTemp TSH series can be used with integrated SIL-certified transmitters acc. to IEC61508 / IEC61511 in safety-related systems. Before commissioning the device read the SIL safety information for the relevant transmitter.

3 Installation

3.1 General



Caution – Cancellation of the IP protection class!

Damage to components such as housing, threads, cable glands or seals, cancels the IP protection class of the temperature sensor.

Install connection lines, terminal block and connection points properly. When replacing cable glands, make sure the replacement parts correspond to the IP protection class.

- The temperature sensors must be brought into the best possible contact with the medium to be measured.
- The connection lines must be firmly connected with the connection terminals.
- Observe the correct polarity for thermocouples.
- When installing temperature sensors in existing thermowells, make sure that the temperature sensor can be moved slightly. If this is not the case, the inside of the thermowell must be cleaned.
- This also applies to the installation of interchangeable measuring units. Only ABB original parts may be installed in ABB temperature sensors.
- The temperature sensor must be firmly and securely installed according to the application process.
- After clamping the connection lines using a suitable tool (screwdriver, wrench), ensure that the connection heads are securely closed and sealed. Be sure to observe here that the sealing rings of the connection head are clean and undamaged.
- The seals selected must meet the requirements. Make sure the seals are fitted properly.
- Tighten flange screws in a crosswise manner.



Important

At high temperatures, we recommend installing temperature sensors in vertical position to protect against bending and mechanical damage to the thermowell.

If the sensor has to be installed in a horizontal position, ensure that the thermowell is supported.

3.2 Installation of ceramic protective fittings in systems under operating temperature

Ceramics are characterized by their hardness and brittleness. When ceramic material is exposed to temperature shocks, it can crack due to internal stresses in its grain structure. For this reason, temperature sensors with ceramic protective fittings may only be introduced gradually into the process:

System temperature 1600 °C -> Slide-in rate 1-2 cm/min

System temperature 1200 °C -> Slide-in rate 10-20 cm/min

4 Electrical connection

4.1 General

Observe the corresponding instructions for the electrical installation. Only connect in dead-voltage state!

Since the sensor and transmitter have no switch-off elements, overvoltage protection devices, lightning protection or voltage separation capacity must be provided on the plant side.

The following applies to devices with a transmitter: Energy supply and signal are routed in the same line and are to be implemented as SELV or PELV circuit according to norm (standard version).

It must be checked whether the existing power supply corresponds with the specifications on the model plate and in the technical specifications (see "Technical Specifications" chapter or data sheets).



Important

The electrical connection is carried out with the temperature sensor/transmitter in the installed state.

The signal cable wires must be provided with wire end sleeves.

The maximum connectable conductor cross-section amounts to 1.5 mm² (AWG15). The cross-head screws of the connection terminals are tightened with a size 1 screwdriver (3.5 mm or 4 mm). Observe the diameter of the selected cable fitting. (See the "Installation" chapter).

4.1.1 Cables and wires

- Only use insulated cables and wires whose tested voltage between wire - ground, wire - shielding, and shielding - ground amounts to at least 500 V AC.
- Fit cables and wires with end sleeves.
- The cables used must fulfill the valid requirements with regards to strength and temperature for the particular application case.
- The electrical connection wires must be run so that mechanical damage is impossible.
- For the use of PROFIBUS, the running of the wires is performed according to EN 50 170 for PROFIBUS PA.
- For the use of FOUNDATION Fieldbus the running of the wires is performed according to IEC61158.

4.1.2 Terminal connection

1. The power supply should be securely switched off when making electrical connections.
2. Open the connection head. Observe the cool down time!
3. Connect the positive wire with the terminal on the transmitter labeled with the "+" and the negative wire with the terminal labeled with the "-". The use of terminal ends (lugs) is recommended.
4. Establish a ground connection, if necessary.
5. The screws must be tight and a good contact must be ensured.
6. The connection head must be tightly closed (see the "Installation" chapter).

4.2 Operation in intrinsically safe circuits

**Danger – Serious damage to health / risk to life**

Use of temperature sensors without explosion protection in an explosive area can result in an explosion.

Temperature sensors in the SensyTemp TSH series may not be used in explosion-protection areas.

When operating a temperature sensor from the SensyTemp TSH series in an EEx ia/ib intrinsically safe circuit, the operators must comply with all regulations and technical data according to DIN EN 60079-14 (VDE 0165-1) para. 12.

Proof that the interconnection is intrinsically safe must be provided in accordance with DIN VDE 0165/08.98 (EN 60 079-14/1997 and IEC 60 079-14/1996). In general, intrinsically safe circuits require proof of interconnection. For proof of the intrinsic safety, the electrical limit values are to be used as the basis for the EC-Type-Examination Certificate and manufacturer's declarations for the apparatuses (devices), including capacitance and inductivity values of the wires. These requirements ensure that operation of a temperature sensor in the SensyTemp TSH series does not cancel the intrinsic safety of a circuit.

Temperature sensors in the SensyTemp TSH series that are intended for use in intrinsically safe circuits are delivered with a manufacturer's declaration. If two transmitters are used for two intrinsically safe circuits, the sum of the values may not exceed the maximum values specified in the operating instructions.

**Important**

Refer to the technical data for the transmitter used and the manufacturer's declaration for the sensor.

**Important**

When temperature sensors from the SensyTemp TSH series are used in with doubled measuring units in intrinsically safe circuits (2x thermocouples), only one measurement circuit can be connected.

4.3 Connection diagrams for thermocouples

4.3.1 SensyTemp TSH210 temperature sensor

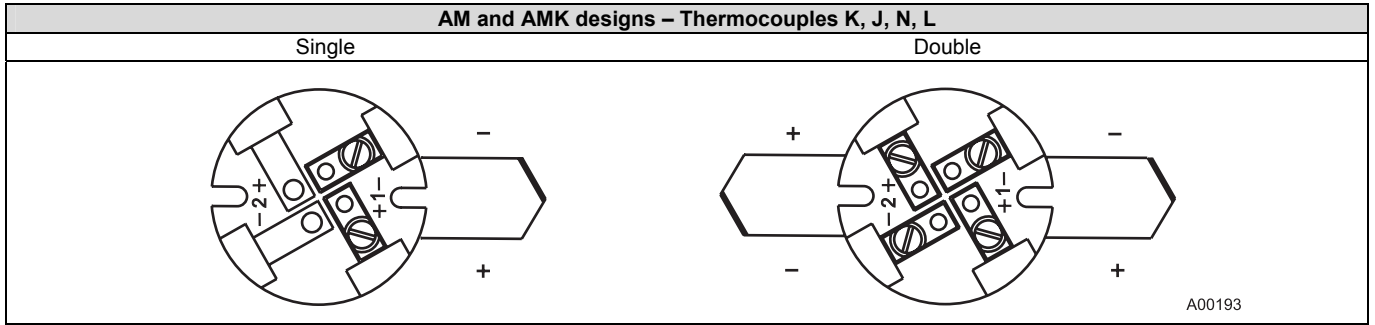


Fig. 1

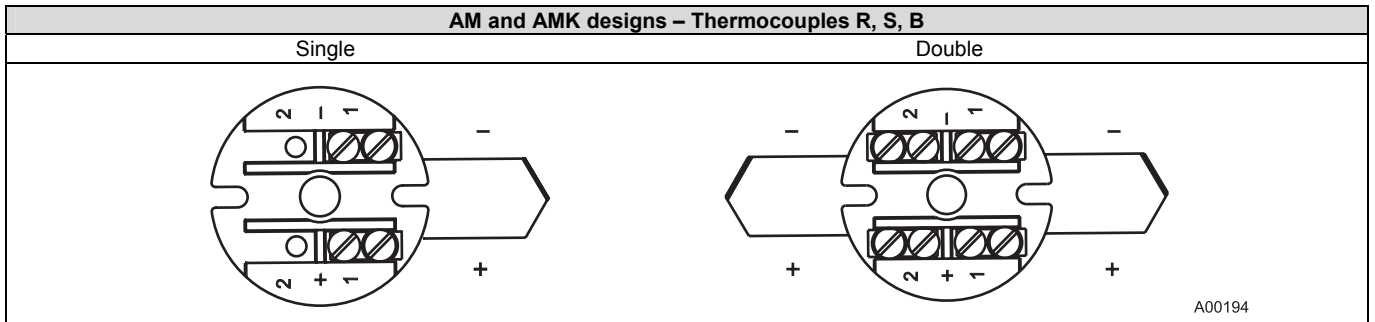


Fig. 2

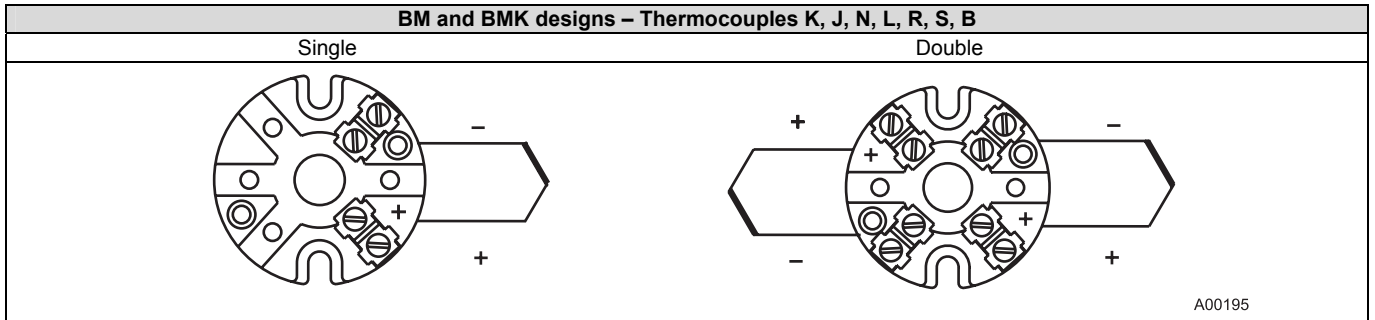


Fig. 3

Electrical connection

4.3.2 SensyTemp TSH220 temperature sensor

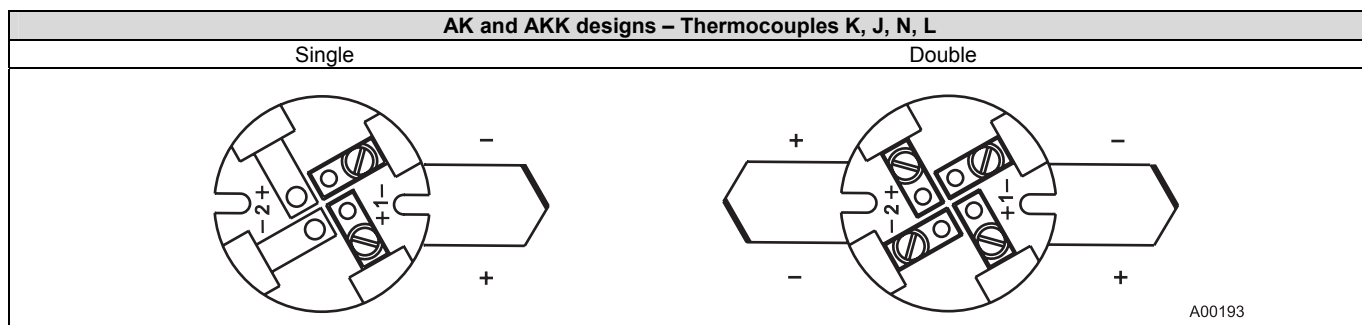


Fig. 4

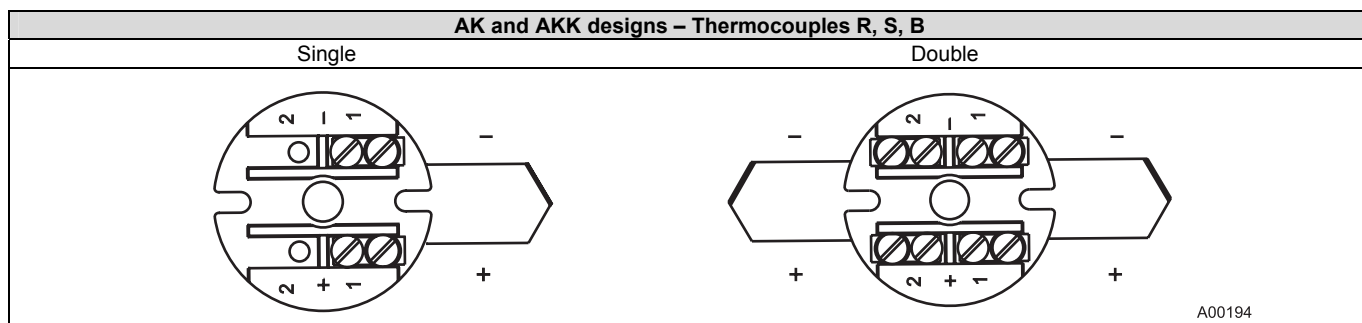


Fig. 5

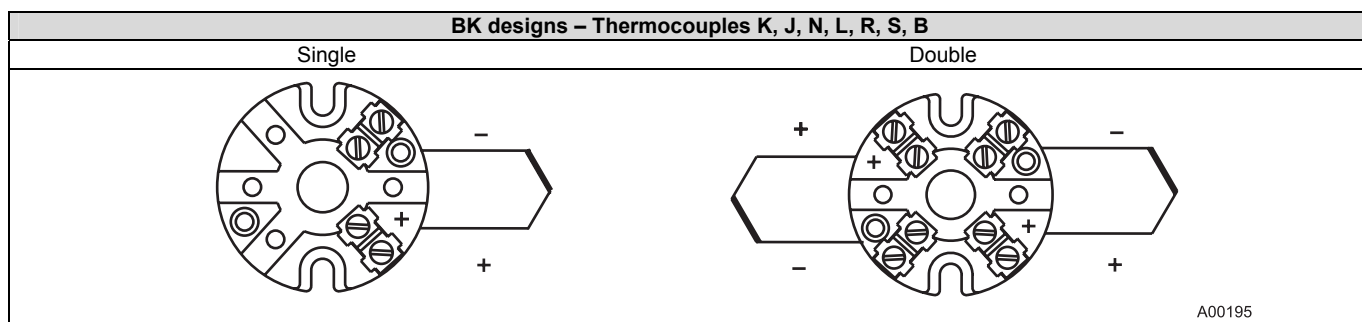


Fig. 6

4.3.3 SensyTemp TSH250 temperature sensor

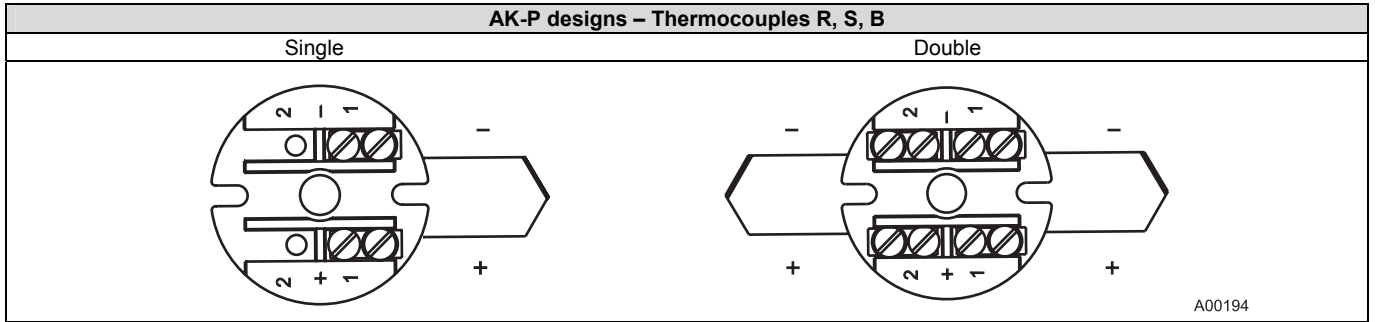


Fig. 7

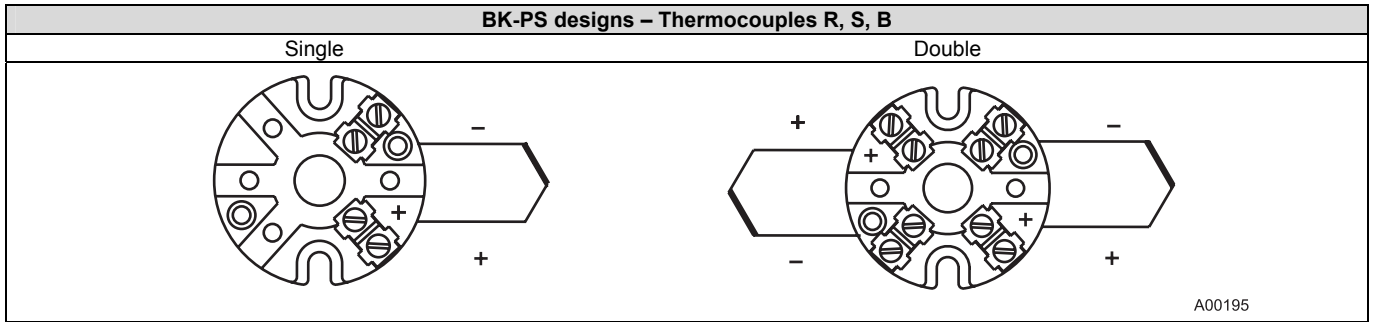


Fig. 8

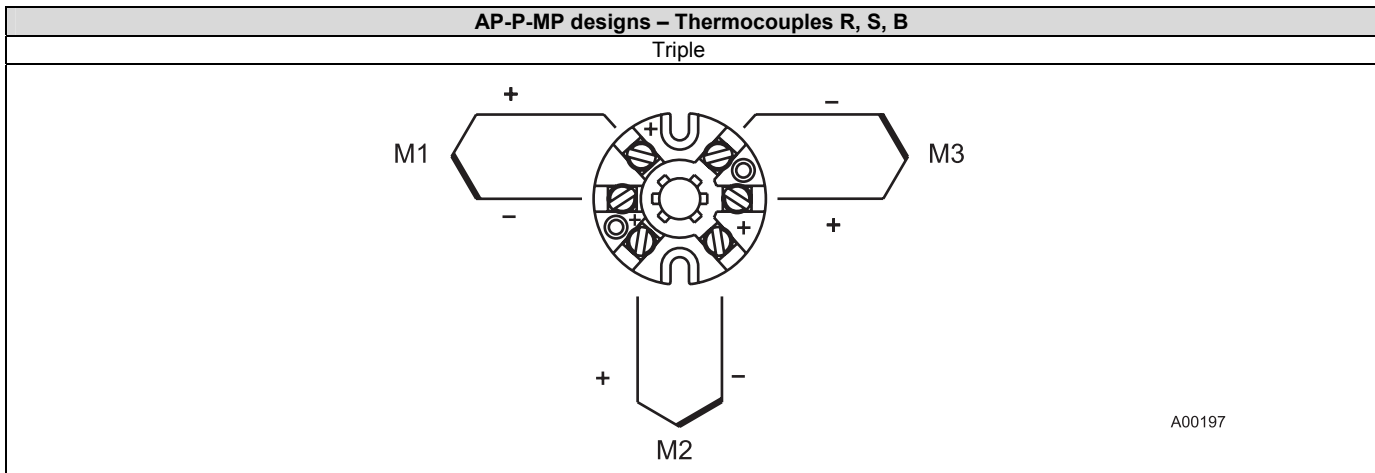


Fig. 9

4.4 Temperature sensor connection with transmitter

Observe the corresponding documents for the interconnection of transmitters and feed separators (Example, see TTH300 operating instructions; document name OI/TTH300).

Suggested installation PROFIBUS PA	See ABB documentation 10/63-0.40.
Suggested installation FOUNDATION Fieldbus	See ABB documentation 10/63-0.50.

The operating instructions for the selected transmitter are included in the delivery by ABB. This information is additionally available for download on the Internet at www.abb.com/temperature. The technical data of the selected transmitter must be complied with.

5 Startup Operation

The following must be checked before commissioning:

- The proper mounting and sealing of thermowells or protective sleeves
- The connection for the ground wire.
- The compliance of the electrical specifications with the specified values.
- The electrical connection and the installation must be performed according to the “Installation” and “Electrical connection” chapters.



Warning - General hazards!

The relevant safety and accident prevention regulations must be complied with.

- The associated technical documentation for the operation of transmitters and display units is to be observed. The technical documentation is also available on the Internet at www.abb.com/temperature.

6 Appendix



Important

All documentation, declarations of conformity and certificates are available in the download area of ABB Automation Products GmbH.

www.abb.com/temperature

6.1 Additional documents

- Operating instructions for SensyTemp TSH200 (OI/TSH200)
- Data sheet for SensyTemp TSH200 (DS/TSH200)
- Operating instructions of the installed transmitter (if available)
- SIL safety handbook of the installed transmitter (if available)

6.2 Supplementary documents

Temperature transmitter for sensor head mounting

- Data sheet TH01, TH01-Ex; 3KDE115080R10xx
- Data sheet TH02, TH02-Ex; 10/11-8.19
- Data sheet TF12, TF12-Ex; 10/11-8.26
- Data sheet TF02, TF02-Ex; 10/11-8.25
- Data sheet TTH300; DS/TTH300

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Printed in the Fed. Rep. of Germany (12.2007)

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3KXT141001R4401



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