



Temperature Transmitter

# TRV 5-40



CANopen

EN  
English

Original Installation Instructions  
**818712-01**

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## Important Notes

### Usage for the intended purpose

The temperature transmitter TRV 5-40 in conjunction with the temperature sensors TRG 5-63, TRG 5-64, TRG 5-65, TRAG 5-67 and TRG 5-58 must only be used for measuring temperatures.

### Safety note

The equipment must only be installed and commissioned by qualified and competent staff. Retrofitting and maintenance work must only be performed by qualified personnel who – through adequate training – have achieved a recognised level of competence.

### PED (Pressure Equipment Directive)

The equipment fulfils the requirements of the Pressure Equipment Directive 2014/68/EU and can be used with fluids of group 1 and 2. With CE marking.

### ATEX (Atmosphère Explosible)

According to the European Directive 2014/34/EU the equipment must not be used in explosion risk areas.

### Note on the Declaration of Conformity / Declaration by the Manufacturer C€

For details on the conformity of our equipment according to the European Directives see our Declaration of Conformity or our Declaration of Manufacturer.

The current Declaration of Conformity and Declaration of Manufacturer are available in the Internet under [www.gestra.com](http://www.gestra.com) ➔ documents or can be requested from us.

## Explanatory Notes

### Scope of supply

#### TRV 5-40

1 Temperature transmitter TRV 5-40

4 Fixing lugs

1 M 12 sensor connector, 5 poles, A-coded, with terminating resistor 120 Ω

1 Installation manual

### Description

The temperature transmitter TRV 5-40 is designed for the connection of three temperature sensors TRG 5-6x (platinum resistance thermometer Pt 100 to EN 60751). The temperatures measured by the temperature sensors are converted by the temperature transmitter TRV 5-40 and sent to the CAN bus in the form of a data telegram.

The data are transferred via CAN bus, using the CANopen protocol.

## Explanatory Notes – continued –

### Description – continued –

The temperature transmitter TRV 5-40 can be used as:

- safety temperature monitor / limiter in conjunction with a temperature sensor type TRG 5-6x and the control unit NRS 1-40.1 / NRS 1-40.2 and
- temperature monitor & limiter in conjunction with one or two temperature sensors TRG 5-6x and the control unit TRS 5-40 or any other equipment that is approved for this application.

The equipment combination can be used for monitoring, limiting or control purposes in steam plants and (pressurised) hot water installations according to TRD and EN 12952 and EN 12953.

### Function

The temperature transmitter TRV 5-40 consists of the safety part for temperature limiting and the part for temperature monitoring & control.

The safety part is connected with the temperature sensor. The temperature sensor detects the temperature and sends the measured values to the safety part of the temperature transmitter, where the measured values are recorded redundantly and monitored.

The adjustable temperature limit  $T_{MAX}$  (°C), the actual temperature and system malfunctions are indicated by the temperature transmitter. The temperature sensing element on the electronic insert monitors continuously the temperature inside the transmitter housing. An automatic self-testing routine checks every 10 seconds the safety and reliability of the functions of the temperature sensor and the detection of the measured values.

The actual temperatures, the exceeding of the adjusted temperature limit  $T_{MAX}$  (°C), the result of the periodic self test and the temperature inside the transmitter housing are sent as a data telegram via CAN bus to the control equipment NRS 1-40.1 / NRS 1-40.2.

Regardless of the safety part two additional temperature sensors TRG 5-6x can be used for temperature monitoring & control in order to measure further actual temperature values. These readings are also sent as data telegrams via CAN bus and will be evaluated e. g. by the control unit TRS 5-40.

### System components

#### **TRG 5-6x**

Temperature sensor with resistance thermometer Pt 100

#### **TRS 5-40**

Digital temperature switch

Functions: MIN / MAX temperature monitor and temperature controller

Data exchange: CAN bus to ISO 11898 via CANopen protocol

#### **NRS 1-40.1 and NRS 1-40.2**

Digital control unit for four sensors (level, temperature)

Functions: Signalling MIN alarm and MAX alarm in freely adjustable combinations

Data exchange: CAN bus to ISO 11898 via CANopen protocol

#### **URB 2**

Operating & visual display unit

Functions: Parameterisation, visual indication via LCD display

Data exchange: CAN bus to ISO 11898, with CANopen protocol

## Technical Data

### TRV 5-40

#### Type approval

TÜV. SWB/SHWS. 03–413

EG BAF-MUC 03 07 103881 004

DIN registry no. STW (STB) 117 906

#### Input/Output

CAN bus interface with current supply 18 – 36 V DC, short circuit protected

#### Temperature sensors

TRG 5-63

1x Pt 100 to EN 60751

TRG 5-64

2x Pt 100 to EN 60751

TRG 5-65, TRG 5-66

1x Pt 100 to EN 60751

TRG 5-67

1x Pt 100 to EN 60751

TRG 5-68

2x Pt 100 to EN 60751

#### Temperature limit $T_{MAX}$ (°C) (cut-off temperature)

Min. adjustable limit value: 20 °C

Max. adjustable limit value: 650 °C

#### Indicators and adjustors

1 Red three-digit, seven-segment LED display for indicating limit values

1 Green three-digit, seven-segment LED display for indicating the actual value

3 Pushbuttons for limit settings

5 LEDs for internal status messages

1 Code switch with 10 poles for setting the node ID and baud rate

1 Code switch with 10 poles for configuring the system

#### Internal self-checking routine

Every 10 seconds

#### Fault response time

30 sec.

#### Power consumption

2 W

#### Fuse

Electronic thermal fuse  $T_{MAX}$  85 °C, hysteresis –2K

#### Protection

IP 65 to EN 60529

#### Max. admissible ambient temperature

70 °C

## Technical Data – continued –

### TRV 5-40 – continued –

#### Housing

Material: polycarbonate

#### Cable entry / Wiring

For connecting the temperature sensor:

Cable glands with integrated cable clamp, 3 x M 16,  
1 three-pole and 1 six-pole screw-type terminal strip, conductor size 1.5 mm<sup>2</sup>

For CAN bus connection:

M 12 sensor connector, 5 poles, A coded

M 12 sensor jack, 5 poles, A coded

#### Weight

Approx. 0.7 kg

### Name plate / Marking






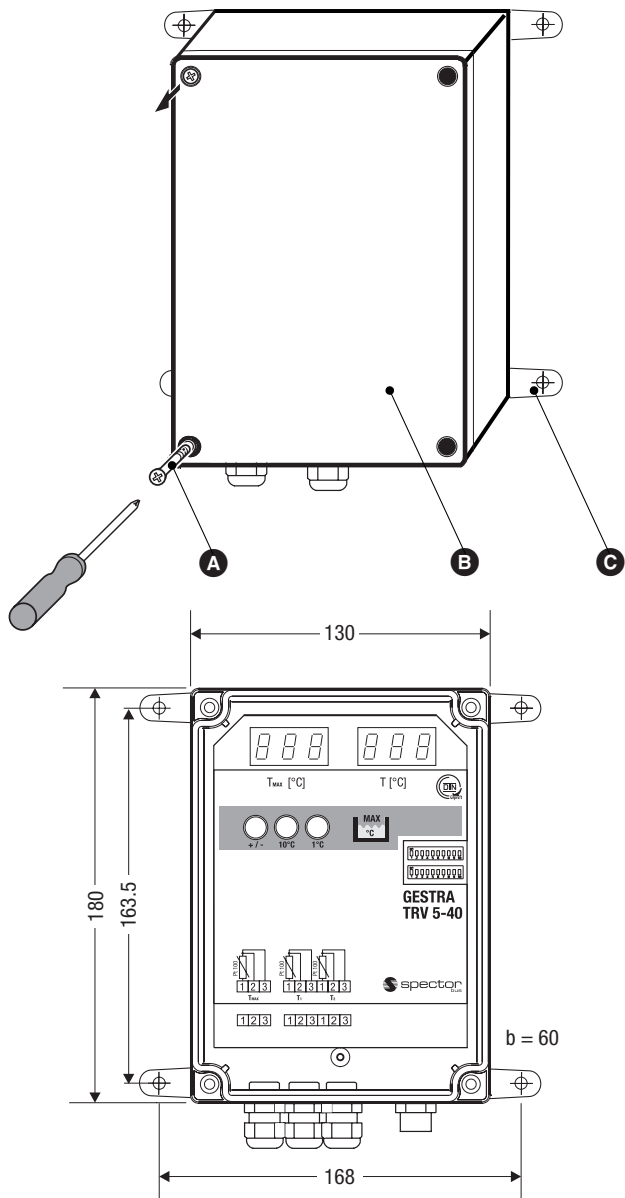
 	
Betriebsanleitung beachten See installation instructions Voir instructions de montage	
<b>TRV 5 - 40</b>	
Temperaturtransmitter Temperature transmitter Transmetteur de température	
<b>T<sub>MAX</sub></b> ..... °C	
IN: Pt 100	Tamb = 70°C (133°F)
IN / OUT: CAN-Bus 18-36 V DC	IP 65 
<b>Node ID:</b> _ _ _ _	
Funktionale Sicherheit Functional safety Sécurité fonctionnelle IEC 61508 SIL 2	
TÜV , SWB/SHWS STW(STB) ,XX- 413 DIN STW (STB) 117908	 0525
<b>GESTRA AG</b> Münchener Str. 77 D-28215 Bremen	

Fig. 1

**Dimensions TRV 5-40**



**Fig. 2**



# Installation

## Temperature transmitter TRV 5-40

The temperature transmitter TRV 5-40 is designed for wall mounting. Screw the four fixing lugs supplied with the transmitter into the housing. You can now attach the equipment to the wall without having to open the housing cover.



### Note

**After mounting** the housing you must:

- connect the temperature sensor,
- set the temperature limit  $T_{MAX}$  (°C) (see chapter “Commissioning”)
- check and if necessary change the baud rate setting (see chapter “Wiring”)
- check and if necessary change the system configuration (see chapter “Commissioning”)
- check and if necessary change the node ID (see chapter “Annex”)

## Check and if necessary change settings

1. Undo cross recess head screws **A** and swing up the housing cover **B**.
2. Use pushbuttons **K** for setting the temperature limit  $T_{MAX}$  (°C).
3. Use code switches **F** and **G** to set the system parameters.
4. Close the housing cover **B** and fasten the cross recess head screws **A**.

## Tools

- Screwdriver 5.5/100
- Screwdriver for cross recess head screws, size 2

## Functional Elements

### TRV 5-40

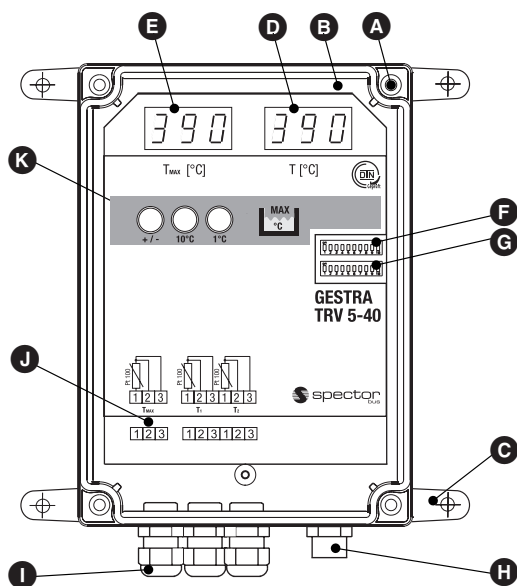


Fig. 3

### Key

- A** Cross recess head screws
- B** Housing cover
- C** Fixing lugs for wall mounting
- D** Indication of limit setting
- E** Indication of actual value
- F** Code switch for node ID and baud rate setting
- G** Code switch for system configuration
- H** M 12 connector/jack, 5 poles, A-coded
- I** Cable gland for temperature sensor
- J** Terminals for temperature sensor
- K** Pushbuttons for limit setting

## Wiring

### Wiring of the temperature sensor

Note that screened four-core cable, e. g. Ölflex® 110CH, Lapp, 4 x 0.5 mm<sup>2</sup> is required for wiring the equipment. Max. cable length between temperature sensor and temperature transmitter TRV 5-40: 25 m.

When the equipment is open:

1. Undo cable gland **1** and pull the cables of the sensors through the glands.
2. Strip off approx. 40 mm of cable insulation coating, remove approx. 5 mm of conductor end insulation and disconnect the screen. Note that the screen must only be connected to the temperature sensor.
3. Connect the sensor cables according to the wiring diagram to the terminal strip **1**.
4. Fasten cable glands **1** to achieve a good seal. Use sealing plugs to seal off cable glands that are not used.

### Bus line, cable length and size

Note that screened multi-core twisted-pair control cable is required for the BUS line, e. g. UNITRONIC® BUS CAN 2 x 2 x ... mm<sup>2</sup> or RE-2YCYV-fl 2 x 2 x ... mm<sup>2</sup>.

Preassembled control cables (with connector and coupler) for connecting the equipment are available as accessories.

The baud rate (data transfer rate) dictates the cable length between the bus nodes and the total power consumption of the sensor dictates the conductor size.

S 8	S 9	S 10	Baud rate	Cable length	Number of pairs and conductor size [mm <sup>2</sup> ]
OFF	ON	OFF	250 kBit/s	125 m	2 x 2 x 0.34
Factory setting					
ON	ON	OFF	125 kBit/s	250 m	2 x 2 x 0.5
OFF	OFF	ON	100 kBit/s	335 m	2 x 2 x 0.75
ON	OFF	ON	50 kBit/s	500 m	on request, dependent on bus configuration
OFF	ON	ON	20 kBit/s	1000 m	
ON	ON	ON	10 kBit/s	1000 m	

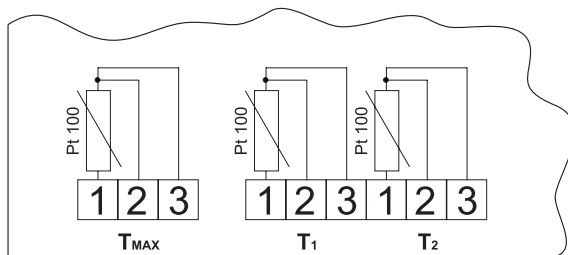
When the equipment is open you can set the baud rate by using the code switch **1** Fig. 3 (S 8 to 10). The baud rate of the temperature transmitter TRV 5-40 is set at our works to 250 kBit/s (for a max. cable length of 125 m). Reduce the baud rate if the cable length exceeds 125 m. Make sure that all bus nodes feature the same baud rate setting.



#### Note

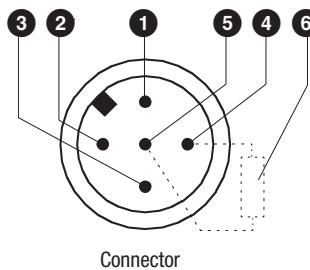
The specified max. baud rates and cable lengths are based on empirical values ascertained by GESTRA. However for some applications it might be necessary to reduce the baud rate in order to ensure trouble-free operation.

**Wiring diagram for temperature transmitter TRV 5-40**

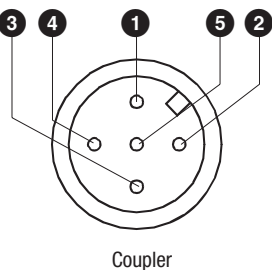


Connection of temp. sensor used as safety limiter

Connection of temp. sensor used as temperature monitor



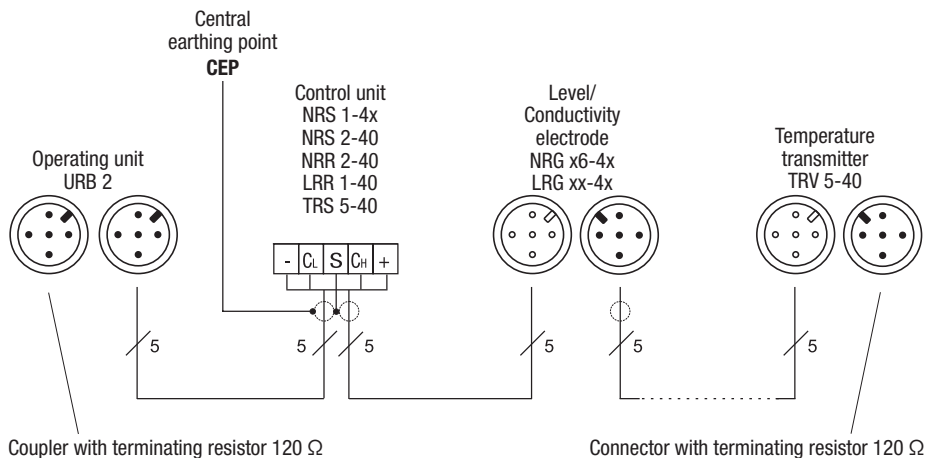
Connector



Coupler

**Key**

- ① Screen
- ② Voltage supply 24 V DC+
- ③ Voltage supply 24 V DC-
- ④ CAN data line C<sub>H</sub>
- ⑤ CAN data line C<sub>L</sub>
- ⑥ Terminating resistor 120 Ω



Coupler with terminating resistor 120 Ω

Connector with terminating resistor 120 Ω

**Fig. 4**



#### Attention

- Wire equipment in series. Start-type wiring is not permitted!
- Link screens of bus cables such that electrical continuity is ensured and connect them once to the central earthing point (CEP).
- Connect the screens of the sensor lines only once to the temperature sensor (EMC cable gland).
- If two or more system components are connected in a CAN bus the first and the last item of equipment **must** be provided with a terminating resistor of 120  $\Omega$  (terminals C<sub>H</sub>/C<sub>L</sub>). We recommend that you use the TRV 5-40 equipped with the connector fitted with the terminating resistor either as first or as last equipment.
- The CAN bus network must not be interrupted during operation.  
**In the event of an interruption an alarm message will be triggered.**

#### Connecting the connector and jack

If you do not use the preassembled control cables connect the connector and the jacks for the CAN bus lines in accordance with the wiring diagram.

#### Tools

- Screwdriver for slotted screws, size 2.5, completely insulated to VDE 0680-1
- Screwdriver for cross recess head screws, size 2

## Basic Settings

### Factory settings

The temperature transmitter TRV 5-40 features the following factory set default values:

- Node ID: 005 for the safety part
- Baud rate: 250 kBit/s (125 m cable length)
- Configuration: temperature transmitter TRV 5-40 set as limiter 4.

## Commissioning

### Checking wiring

Before installation check the wiring:

- Are the temperature sensors wired according to the wiring diagram?
- Is the wiring of all CAN bus devices in accordance with the wiring diagrams?
- Is the polarity of the bus line always correct?
- Are all the end-of-line devices of the bus line provided with a 120  $\Omega$  terminating resistor?

### Applying supply voltage

Switch on supply voltage. The two seven-segment indicators are tested, which means that all segments and decimal points are flashing. The test is also carried out whenever the connector for the bus line is pulled out of the transmitter and then plugged in again.

### Changing system configuration

The control units NRS 1-40.1 and NRS 1-40.2 associated with the temperature transmitter TRV 5-40 are designed for four limiting functions for monitoring liquid level and temperature. The level electrodes NRG 1x-40, NRG 1x-41.1 and the temperature transmitter TRV 5-40 are to be connected to the control unit NRS 1-40.1. The level electrode NRG 1x-41 and the temperature transmitter TRV 5-40 have to be connected to the control unit 1-40.2.

For the operation of the limiting system it is necessary to establish in the control unit the number of sensors with which the equipment has to work.

For more information see chapter "Commissioning" in the installation manual NRS 1-40.1 and NRS 1-40.2.

The following settings can be adjusted with the TRV 5-40:

- Communication with control unit NRS 1-40.1 or NRS 1-40.2
- Communication with the control unit operating as limiter 1, 2, 3 or 4

## Commissioning – continued –

### Changing system configuration – continued –



Toggle switch white

Code switch <b>G</b>								Limiter Number
S1	S2	S3	S4	S5	S6	S7	S8	
ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	1
OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	2
OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	3
OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	4
Factory setting								

S9	S10	Communication with control unit
OFF	OFF	NRS 1-40.1
ON	ON	NRS 1-40.2

### Examples of configuration settings

#### 1 Example

The following items of equipment are connected to the control unit NRS 1-40.1:

2 Level electrodes NRG 1x-40 for low water level LW 1 and 2

1 Level electrode NRG 1x-41.1 for high water level HW and

1 Temperature transmitter TRV 5-40 for MAX temperature

As only in the temperature transmitter TRV 5-40 the limiter number can be adjusted, the control unit NRS 1-40.1 has to be configured as follows:

Limiter	B1	B2	B3	B4
<b>Function</b>	<b>Water level LW 1</b>	<b>Water level LW 2</b>	<b>High water HW</b>	<b>Temperature MAX</b>

Set the temperature transmitter TRV 5-40 as limiter 4.

#### 2 Example

The following items of equipment are connected to the control unit NRS 1-40.1:

2 Level electrodes NRG 1x-40 for water level LW 1 and 2 and

1 Temperature transmitter TRV 5-40 for MAX temperature

Limiter	B1	B2	B3	B4
<b>Function</b>	<b>Water level LW 1</b>	<b>Water level LW 2</b>	<b>Temperature MAX</b>	

Set the temperature transmitter TRV 5-40 as limiter 3.

### Adjusting temp. limit $T_{MAX}$ (°C)

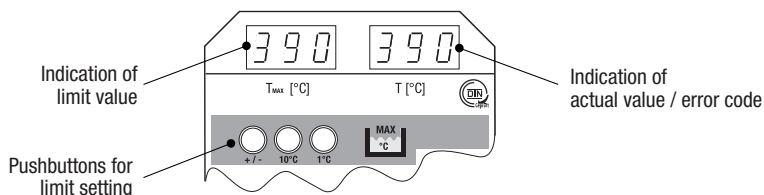


Fig. 5

When the housing is open:

#### Setting the temperature limit $T_{MAX}$ (°C)

Use the three pushbuttons to set the temperature limit  $T_{MAX}$  (°C).

The pushbuttons have the following functions:

- Pushbutton to the right: setting in increments of 1 °C
- Pushbutton in the middle: setting in increments of 10 °C
- Pushbutton to the left: +/- (increase/decrease)

Upon application of the supply voltage and during operation, the adjusted temp. limit  $T_{MAX}$  (°C) and the actual value are indicated.

Press any of the three pushbuttons to switch to the parameter setting mode of the TRV 5-40. Both seven-segment LED displays show the adjusted limit value  $T_{MAX}$  (°C) and all digital points are flashing. The adjusted limit  $T_{MAX}$  (°C) remains valid until the setting of the new value is finished.

If no other pushbutton is pressed within 10 seconds the temperature transmitter switches back to normal operation.

#### Increasing the limit value

When you are in the parameter setting mode press the right (increments of 1°) and/or middle (increments of 10 °C) pushbutton to adjust the desired new limit  $T_{MAX}$  (°C).

To increase or decrease the setting use the left pushbutton (+/-).

#### Decreasing the limit value

When you are in the parameter setting mode first press the left pushbutton (+/-). Then press the right (increments of 1°) and/or middle (increments of 10 °C) pushbutton to adjust the desired new limit  $T_{MAX}$  (°C).

To increase or decrease the setting use the left pushbutton (+/-).

After you have finished the new setting do not press a pushbutton for 10 seconds. The new limit value  $T_{MAX}$  (°C) is then accepted by the temperature transmitter TRV 5-40 and the equipment switches back to normal operation. The new limit value  $T_{MAX}$  (°C) and the actual value will now be indicated.

Please write the new temperature limit  $T_{MAX}$  (°C) on the name plate.



#### Note

In the parameter setting mode the currently adjusted value is indicated by both seven-segment LED displays.



# Start, Operation and Test

## TRV 5-40

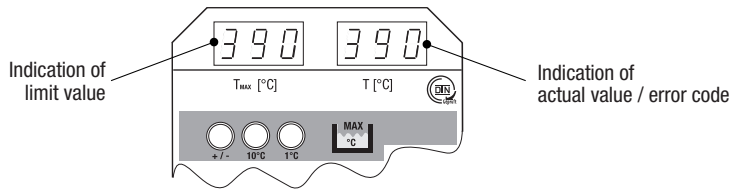


Fig. 6

Start		
Apply supply voltage.	All segments and decimal points of the displays $T_{MAX}$ and T are flashing.	The LED displays are being tested.

Operation		
Actual value T (°C) below limit value $T_{MAX}$ (°C)	Display $T_{MAX}$	Indication of the adjusted limit
	Display T	Indication of the actual value
Actual value T (°C) above limit value $T_{MAX}$ (°C)	Display $T_{MAX}$	Indication of the adjusted limit
	Display T	Indication of the actual value and triggering of an alarm. Control unit NRS 1-40.1 / NRS 1-40.2 opens the output contacts after the time delay has elapsed.

Test		
The pushbutton for the TRV 5-40 on the <b>control unit NRS 1-40.1 / NRS 1-40.2</b> must be pressed and held down until the test is finished.	Display T	An increase in temperature is simulated and the indicated actual value rises steadily. When the adjusted limit value is exceeded, the control unit NRS 1-40.1 / NRS 1-40.2 opens the output contacts after the time delay has elapsed.

Indication of an error code		
When an error occurs	Display T	Display switches between indication of error code (E xx) and actual value T. The control unit NRS 1-40.1 / NRS 40.2 opens instantaneously the output contacts and the output of terminal 7,8 is energised/de-energised in a time-controlled manner.

## System Malfunctions

### Causes

Faulty installation and/or configuration of CAN bus components, excessively high temperatures in devices, defective electronic component parts or electromagnetic interferences of the supply system can result in system malfunctions.

Other malfunctions are:

- Incorrect communication in the CAN bus system
- Overloading of the 24 V power supply unit that is integrated in the control unit



### Note

**Before carrying out the system malfunction analysis please check:**

**Wiring:**

Is the wiring in accordance with the wiring diagrams?

Is the polarity of the bus lines always correct?

Are the bus lines of the first and the last devices provided with 120  $\Omega$  terminating resistors?

**Configuration of the level electrode NRG 1x-40 (Low water level LW):**

Are the wire bridges (equipment 1 or 2) set correctly?

Does the position of the wire bridge correspond with the node ID setting?

**Configuration of the temperature transmitter TRV 5-40:**

Is the temperature transmitter TRV 5-40 set correctly as equipment 1, 2, 3 or 4?

**Node ID:**

Are all node ID settings correct?

Note that no node ID setting must be used twice!

**Baud rate:**

Does the baud rate setting correspond with the cable length?

Is the baud rate setting of all devices identical?

## Systematic malfunction analysis

The sources of malfunctions occurring in CAN bus systems operating with several bus-based stations must be analysed systematically since faulty components or incorrect settings can give rise to negative interactions with intact bus devices in the CAN bus system. These unwanted interactions can cause error messages in fully functional bus devices, which will make fault detection even more difficult.

**We recommend the following systematic fault finding procedures:**

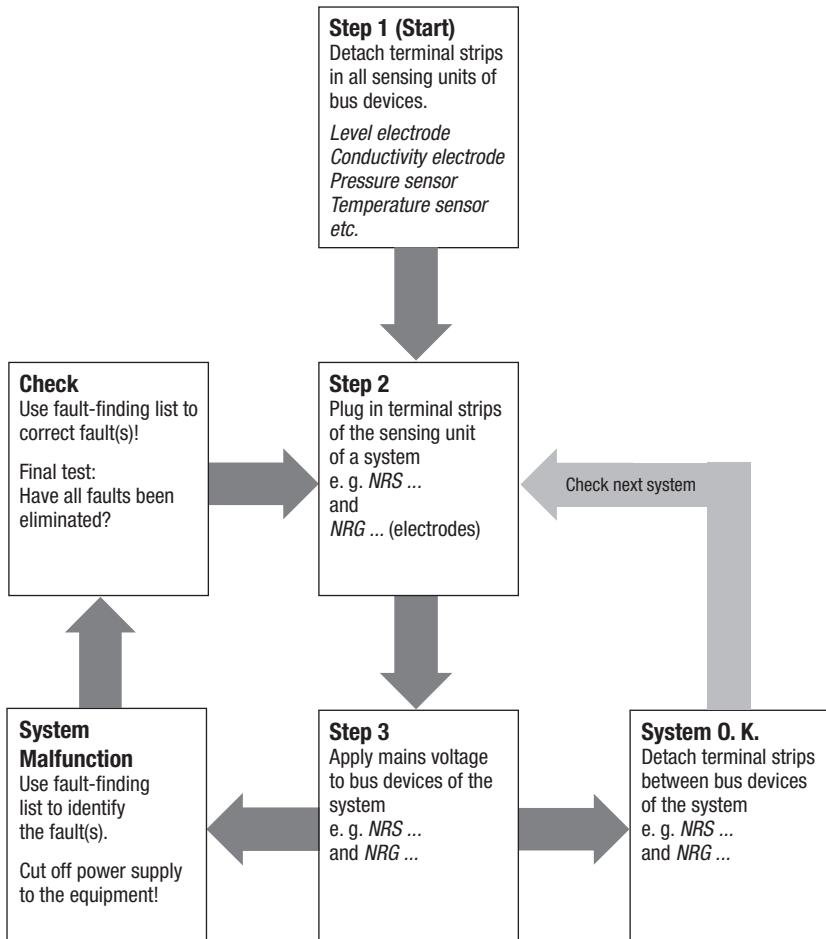


Table listing error codes

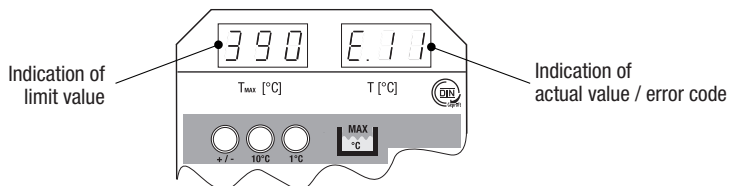


Fig. 7

Indication of error code		
When an error occurs	Indication T	Display switches between indication of error code (E xx) and actual value T
<b>E.01 ... E.32</b>	Temperature transmitter defective because a malfunction was detected during one or more self-testing routines.	Replace temperature transmitter.
<b>E.11</b>	Temperature in transmitter housing too high.	Check installation of the temperature transmitter.
<b>E.12</b>	Resistance in temperature sensor too high.	Check readings of the temperature sensor (see table "Basic values of measuring resistors"). Replace measuring element if the measured values are incorrect.
<b>E.17</b>	Incorrect code switch <b>⊕ Fig. 3</b> (Configuration) setting.	Check and correct position of code switches S 9 and S 10 (polynom).
<b>E.18</b>	Incorrect code switch <b>⊕ Fig. 3</b> (Configuration) setting.	Check and correct position of code switches S 1 to S 8 (limiter number).
<b>E.30</b>	Sensor line interrupted or interruption in temperature sensor.	Check sensor line and readings of the temperature sensor (see table "Basic values of measuring resistors"). If the measured values are incorrect replace the measuring element.
<b>E.0b *)</b>	Short circuit in temperature sensor.	Check sensor line and readings of the temperature sensor (see table "Basic values of measuring resistor"). If the measured values are incorrect replace the measuring element.

\*) Do not confuse indication **b** and **6!**

## System Malfunctions – continued –



### Note

The system malfunctions caused by the temperature transmitter TRV 5-40 will also result in system malfunctions in the control units NRS 1-40.1 and NRS 1-40.2, which means that the output contacts open instantaneously and the signal outputs are energised/de-energised in a pulse-controlled way.

When contacting our Technical Services please state the indicated error code.

### Basic values of measuring resistors

°C	0	10	20	30	40	50	60	70	80	90	100	$\Omega$ / $\mu$ rd
0	100.00	103.90	107.79	111.67	115.54	119.40	123.24	127.07	130.89	134.70	138.50	0.385
100	138.50	142.28	146.06	149.82	153.57	157.32	161.04	164.76	168.47	172.16	175.84	0.373
200	175.84	179.51	183.17	186.82	190.46	194.08	197.70	201.30	204.88	208.46	212.03	0.361
300	212.03	215.58	219.13	222.66	226.18	229.69	233.19	236.67	240.15	243.61	247.06	0.350
400	247.06	250.50	253.93	257.34	260.75	264.14	267.52	270.89	274.25	277.60	280.93	0.338
500	280.93	284.26	287.57	290.87	294.16	297.43	300.70	303.95	307.20	310.43	313.65	0.327
600	313.65	316.86	320.05	323.24	326.41	329.57	332.72	335.86	338.99	342.10	345.21	0.315
700	345.21	348.30	351.38	354.45	357.51	360.55	363.59	366.61	369.62	372.62	375.61	0.304
800	375.61	378.59	381.55	384.50	387.45	390.38						0.295

Basic values of measuring resistors according to DIN 43760 for Pt 100.

## Checking Installation and Functions

### Checking the switchpoints

The switchpoints should be checked during commissioning and whenever the measuring elements of the temperature sensors or of the temperature transmitter TRV 5-40 are being exchanged.

To check the switchpoint "MAX temperature limit (°C)" the adjusted limit value must be exceeded.

The equipment must then response as if there were an alarm situation.

## Malfunctions

### Fault-finding list for TRV 5-40 / NRS 1-40.1 / NRS 1-40.2

Switchpoint max. temp. limit (°C) not exceeded – max. temp. alarm raised.

**Fault:** Temperature sensor TRG 5-6x defective.

**Remedy:** Check the readings of the temperature sensor TRG 5-6x (Pt 100). (Basic values of measuring resistors to DIN 43760 for Pt 100). If the measured values are incorrect replace the measuring element of the temperature sensor TRG 5-6x.

If faults occur that are not listed above or cannot be corrected, please contact our Technical Services or the authorized agency in your country.

## Annex

### CAN bus

All devices (level, conductivity) are interconnected via CAN bus. The CANopen protocol is used for the data exchange between the equipment groups. All devices have an electronic address – the node ID. The four-core bus cable serves as power supply and data highway for high-speed data exchange.

The CAN address (node ID) can be set between 1 and 123.

The temperature transmitter TRV 5-40 has already been configured at our works for operation with other GESTRA components and can be used straight away without having to set the node ID.

### Factory settings of node ID

Control Units		Sensors	
NRS 1-40.1	ID:001	NRG 16-40	ID:002
		NRG 16-40	ID:003
		NRG 16-41.1	ID:004
NRS 1-42	ID:020	TRV 5-40	ID:005
NRS 2-40	ID:039	NRG 16-42	ID:021
NRR 2-40	ID:040	NRG 26-40	ID:041
LRR 1-40	ID:050	LRG 16-40	ID:051

**Individual node IDs must be set manually in the respective equipment.  
Please observe the pertinent installation instructions.**

**Node ID**

Should it be necessary to establish other node IDs please take the interdependence of the equipment into consideration and assign the node ID for the individual group components according to the following table:

Control unit NRS 1-40.1	Sensor 1 e. g. level electrode NRG 1x-40 as first device	Sensor 2 e. g. level electrode NRG 1x-40 as second device	Sensor 3 e. g. level electrode NRG 1x-41.1	Sensor 4 e. g. temperature transmitter TRV 5-40
X	X + 1	X + 2	X + 3	X + 4
1	2	3*	4	5
<b>Factory setting</b>				

**Reserved area**



**Note**

The node ID **3\*** for the second level electrode NRG 1x-40 must be set in situ because the default factory setting is 2.

**Changing node ID for safety part**

When the housing is open:

Use a thin blade screwdriver to set switches S1 to S7 of the code switch  **Fig. 3** in accordance with table “Node ID”.

Enter the adjusted node ID on the name plate.



**Note**

The two node IDs for the two actual value outputs (part for temperature monitoring and control) are linked with the node ID of the safety part and cannot be adjusted. For more information see the installation manual of the control unit TRS 5-40.



**Attention**

Do not use a node ID for more than one item of equipment in the CAN bus system. The node ID 0 is not permissible.



**Table “Node ID”**

In a CAN bus system a maximum of 123 nodes (devices) can be administered. Each node has its own address (node ID). This address can be set via a 10-pole code switch **F** Fig. 3.



**F**

Toggle switch, white

		Node ID	5
S1	<b>ON</b>	1	
S2	OFF	2	
S3	<b>ON</b>	4	
S4	OFF	8	
S5	OFF	16	
S6	OFF	32	
S7	OFF	64	

**(Factory setting)**



**F**

Toggle switch, white

		Node ID	10
S1	OFF	1	
S2	<b>ON</b>	2	
S3	OFF	4	
S4	<b>ON</b>	8	
S5	OFF	16	
S6	OFF	32	
S7	OFF	64	

**(Example)**

**Table Baud rate**

S 8	S 9	S 10	Baud rate	Cable length
<b>OFF</b>	<b>ON</b>	<b>OFF</b>	<b>250 kBit/s</b>	<b>125 m</b>
Factory setting				
ON	ON	OFF	125 kBit/s	250 m
OFF	OFF	ON	100 kBit/s	335 m
ON	OFF	ON	50 kBit/s	500 m
OFF	ON	ON	20 kBit/s	1000 m
ON	ON	ON	10 kBit/s	1000 m

### Decommissioning

First disconnect the temperature sensor TRG 5-6x and then withdraw the sensor lines from the cable glands. Unplug the connecting plug and the connecting jack of the CAN bus lines and plug them together.

Deinstall the temperature transmitter TRV 5-40.



#### Attention

If the CAN bus line is interrupted an alarm will be triggered.

### Disposal

Deinstall the temperature transmitter TRV 5-40 and separate the waste materials in accordance with the material specification. Electronic components (boards) must be disposed of separately.

For the disposal of the temperature transmitter TRV 5-40 observe the pertinent legal regulations concerning waste disposal.

**For your notes**



Agencies all over the world: [www.gestra.de](http://www.gestra.de)

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