



Test Station NRA 1-3  
NRA 1-3 mit CAN-Bus Schnittstelle

# NRA 1-3



EN  
English

Original Installation Instructions  
**818678-05**

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## Important notes

### Usage for the intended purpose

Use test station NRA 1-3 only in conjunction with electrodes NRG 16-19, NRG 16-27 and NRG 16-28 for monitoring steam traps for banking-up of condensate and loss of steam.

### 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 staff who - through adequate training - have achieved a recognised level of competence.



#### Danger

The terminal strips of the test station NRA 1-3 are live during operation. This presents the danger of electric shock!

**Always cut off power supply** to the equipment before mounting, removing or connecting the terminal strips!

### ATEX (Atmosphère Explosible)

According to the European Directive 94/9/EC the equipment must not be used in explosion-risk areas.

### LV (Low Voltage) Directive and EMC (Electromagnetic Compatibility)

The equipment meets the requirements of the Low Voltage Directive 2006/95/EC and the EMC Directive 2204/108/EC.

### Note on the Declaration of Conformity / Manufacturer's Declaration **CE**

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 / Declaration of Manufacturer are available in the Internet under [www.gestra.de](http://www.gestra.de) → Documents or can be requested from us.

### Scope of supply

#### **NRA 1-3**

1 Test station NRA 1-3  
1 Installation manual

or

#### **NRA 1-3**

1 Test station NRA 1-3 with CAN Bus Interface  
1 Installation manual

## Explanatory Notes

### Description

The measuring electrode detects banking-up of condensate and steam loss either directly in the steam trap or in separate test chambers.

The measuring electrodes NRG 16-27, NRG 16-28 feature an additional temperature sensor for measuring the condensate temperature.

The test station NRA 1-3 is designed for the connection of up to max. 16 measuring electrodes and a temperature sensor for measuring the plant temperature.

The test station NRA 1-3 is also available with a CAN bus interface.

### Function

The following electrodes can be used for monitoring steam traps:

- Measuring electrode NRG 16-19 (conductive) for detecting banking-up of condensate or steam loss (electrode submerged or exposed) or
- Measuring electrode NRG 16-27, NRG 16-28 for detecting steam loss (conductive) and banking-up of condensate by measuring the condensate temperature by means of an integrated temperature sensor Pt 1000.

Three LEDs indicate banking-up of condensate, steam loss and malfunction in measuring electrode (cable disruption, short circuit) and a three-digit seven-segment display shows the number of the faulty steam trap. If more than one steam trap are defective the numbers of the faulty traps are indicated one after another.

If banking-up of condensate, steam loss or malfunction in measuring electrode is indicated, an output relay for the collective alarm will also be energised.

When using the measuring electrodes NRG 16-27, NRG 16-28 you can set the switchpoint for the message "Banking-up of condensate" as a function of the plant temperature that is detected separately or of the temperature measured in the steam trap.

The seven-segment display indicates every 6 months the maintenance interval of the measuring electrodes in the form of an error code.

The seven-segment display indicates also status and error messages.

For processing the measured values by a visual display unit - e. g. Spectorcontrol - the test station NRA 1-3 is available with a CAN bus interface. The CANopen protocol is used for data exchange. The electronic address (node ID) identifies the test station.

### System components

#### **TRG 5-53 (e.g.)**

Temperature sensor with resistance thermometer Pt 100 for measuring the plant temperature.

#### **NRG 16-19**

Measuring electrode for detecting banking-up of condensate or steam loss (electrode submerged or exposed).

#### **NRG 16-27, NRG 16-28**

Measuring electrode for detecting banking-up of condensate or steam loss (electrode submerged or exposed) with integrated temperature sensor Pt 1000 for measuring the condensate temperature.

## Technical Data

### NRA 1-3 / NRA 1-3 with CAN Bus interface

#### Supply voltage

230 V, 50 / 60 Hz

115 V, 50 / 60 Hz optional

#### Only NRA 1-3 with CAN Bus interface

#### Supply voltage

24 V DC +/- 20 % via CAN Bus interface

#### Data exchange

CAN bus to ISO 11898, CANopen protocol

#### NRA 1-3 and NRA 1-3 with CAN bus interface

#### Fuse

external, slow-blow 200 mA

#### Power consumption

max. 5 VA

#### Inputs

16 inputs for measuring electrodes NRG 16-19, NRG 16-27, NRG 16-28

1 input for temperature sensor, e. g. TRG 5-53, measuring insert PT 100

max. length of connecting cables: 100 m

#### Output

1 volt free changeover contact, 4 A 24 V AC/DC, 115 V AC and 230 V AC

Inductive loads must be provided with interference suppressors (RC combinations) as specified by the manufacture

#### Electrode voltage

12 V

#### Settings for banking-up of condensate

Difference between condensate and plant temperatures **dts** 1 K to 100 K, adjustable in steps of 1 K (mode 1 and 6)

Difference between condensate temperature and switchpoint "Banking-up of condensate" **dTC**

1 K to 100 K, adjustable in steps of 1 K (mode 2 and 7)

Switchpoint "Banking-up of condensate" 0 °C to 255 °C, adjustable in steps of 5 K (mode 2 and 7)

#### Indicators and adjustors

1 three-digit seven-segment LED display, red, for indicating faulty steam traps and status and error messages

3 LEDs for indicating banking-up of condensate, steam loss and malfunction in measuring electrode

3 pushbuttons for operating the equipment

1 ten-pole code switch for system configuration, node ID and baud rate setting

#### Versions

NRA 1-3a for wall mounting

NRA 1-3e for panel mounting

Housing material: ABS

#### Protection

NRA 1-3a: IP 65 to EN 60529

NRA 1-3e: Front: IP 65 to EN 60529, back: IP 00

#### Protection

NRA 1-3a: 2 (completely insulated)

#### Admissible ambient temperature

Max. 55 °C

# Technical Data - continued -

## NRA 1-3 - continued -

### Housing

Housing material: ABS

### Cable gland / Electrical connection

Cable gland with integral cable clamp, 8 x M 16 x 1.5,  
17 five-pole screw-type terminals, conductor size 1.5 mm<sup>2</sup>

### Weight

approx. 2 kg

### Ambient temperature

when system is switched on: 0 ° ... 55 °C  
during operation -10 °... 55 °C

### Transport temperature

-20 °... +80 °C (<100 hours), defrosting time of the de-energized equipment before it can be put into operation: 24 hours.

### Storage temperature

-20 °... +70 °C, defrosting time of the de-energized equipment before it can be put into operation: 24 hours.

### Relative humidity

max. 95%, no moisture condensation

## Name plate/markings











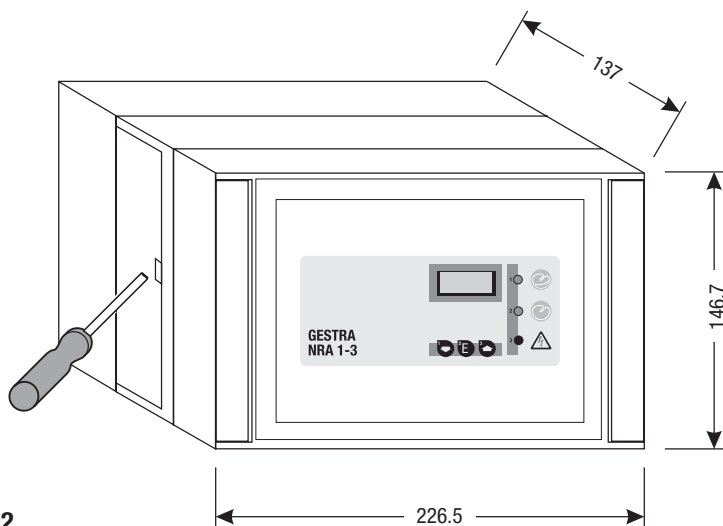
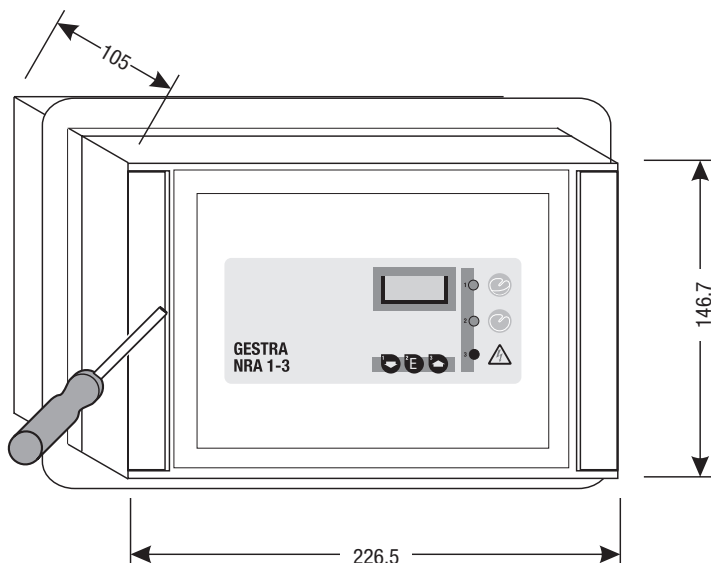
Betriebsanleitung beachten See installation instructions Voir instructions de montage	 	Safety note	Betriebsanleitung beachten See installation instructions Voir instructions de montage	 
<b>NRA 1-3a</b>		Equipment designation	<b>NRA 1-3a CAN BUS</b>	
Prüfstation Remote test unit Station d'essai		Electrical specification	Prüfstation Remote test unit Station d'essai	
115V <input type="checkbox"/> 230V <input checked="" type="checkbox"/>		Protection	24V = +/- 20%	
50 / 60 Hz 5VA IP 65		Max. admissible ambient temperature	5VA IP 65	
Tamb = 55°C (131°F) <input type="checkbox"/>			Tamb = 55°C (131°F) <input type="checkbox"/>	
 250V ~ T2,5A			 250V ~ T2,5A	
GESTRA AG Münchener Str. 77 D-28215 Bremen		Disposal note	GESTRA AG Münchener Str. 77 D-28215 Bremen	
SUL-Nr.:316145.XX SUL-Nr.:316147.XX		Manufacturer	SUL-Nr.:316147.XX SUL-Nr.:316182.XX	
Mat.-Nr.:392533		Spare part specification	Mat.-Nr.:392721	

Fig. 1

**Dimensions NRA 1-3**



**Fig. 2**  
Test station NRA 1-3 a



**Fig. 3**  
Test station NRA 1-3e  
Front panel cut-out 236 x 151



## Installation

### Test station NRA 1-3a

The housing of the test station NRA 1-3a is designed for wall mounting. The four fixing holes are accessible after opening the base part. For this purpose use a screwdriver with a broad blade to lever the hinge out of the slot on the left side **Fig. 2**.

Then use suitable screws and wall plugs to fix the rear cover.

### Test station NRA 1-3e

The housing of the test station NRA 1-3e is designed for panel mounting, panel cut-out: 236 x 151 mm. Place the equipment into the cut-out of the panel.

To unlock the hinge and swing the front panel open use a broad blade screwdriver to lever the front panel out of the frame. Then turn the four screws for the tensioning clamps to the right until the housing is firmly fixed in the panel cut-out, **Fig. 3**.

### Note

#### Test station NRA 1-3a

**After mounting** the equipment you can

- connect the measuring electrodes / temperature sensor
- set the operating mode and the number of the measuring channels (see “Commissioning”) in a single operation with the base part open. Then close the base part and lock the left hinge.

### Tools

- Screwdriver (5.5/100)

# Electrical connection

## Wiring diagram for test station NRA 1-3 and NRA 1-3 CAN

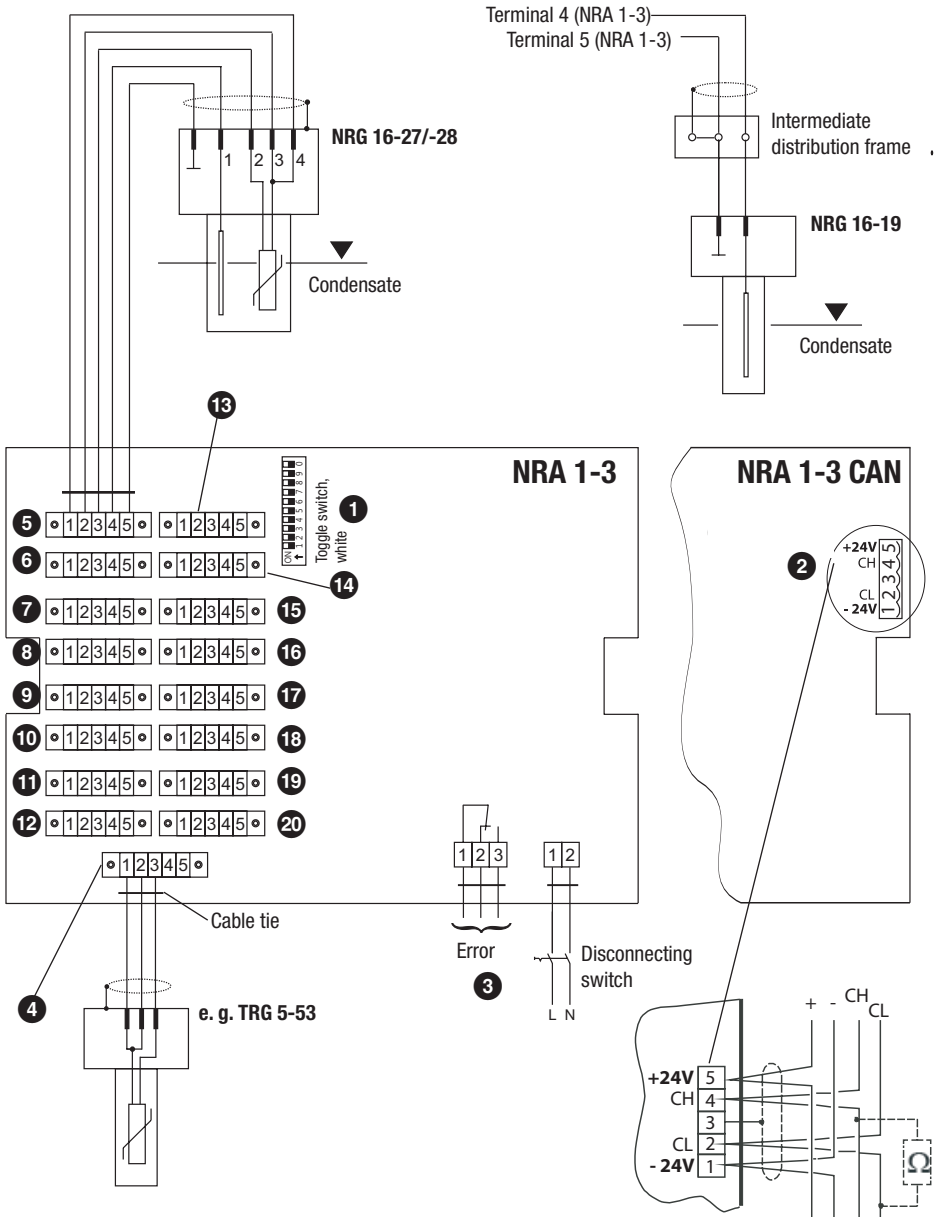


Fig. 4

### Key

- ① Code switch for system configuration
- ② CAN bus interface
- ③ Terminal for collective alarm
- ④ Terminal for temperature sensor (system temperature)
- ⑤ – ⑳ Terminals for measuring electrodes

### Mode 1, 2, 4 – 7

- ⑤ – ⑳ Channel 1 – 16

### Mode 3

- ⑤ Channel 1 Banking-up of condensate
- ⑥ Channel 2 Banking-up of condensate
- ⑦ Channel 3 Banking-up of condensate
- ⑧ Channel 4 Banking-up of condensate
- ⑨ Channel 5 Banking-up of condensate
- ⑩ Channel 6 Banking-up of condensate
- ⑪ Channel 7 Banking-up of condensate
- ⑫ Channel 8 Banking-up of condensate

### Mode 3

- ⑬ Channel 1 Steam loss
- ⑭ Channel 2 Steam loss
- ⑮ Channel 3 Steam loss
- ⑯ Channel 4 Steam loss
- ⑰ Channel 5 Steam loss
- ⑱ Channel 6 Steam loss
- ⑲ Channel 7 Steam loss
- ⑳ Channel 8 Steam loss

## Electrical connection - continued -

### Only for NRA 1-3 CAN: Connection of supply voltage

The equipment is supplied with 24 V DC and fused with an external slow-blow fuse 200 mA. Please use a safety power supply unit with safe electrical isolation.

The power supply unit must be electrically isolated from dangerous contact voltages and must meet at least the requirements on double or reinforced isolation according to one of the following standards: DIN EN 50178, DIN EN 61010-1, DIN EN 60730-1 or DIN EN 60950.

### Connecting line of measuring electrodes

#### NRG 16-19

The measuring electrode comes with a 2 m long connecting cable and can be directly connected to the test station NRA 1-3. To extend the cable use screened two-core cable, e.g. Ölflex 110 CH, manufactured by Lapp, 2 x 0.5 mm<sup>2</sup>. Max. cable length between measuring electrode and test station NRA 1-3: 100 m. Please connect screen to intermediate distribution frame.

#### NRG 16-27, NRG 16-28

For the connecting line use screened five-core cable, e.g. Ölflex 110 CH, manufactured by Lapp, 5 x 0.5 mm<sup>2</sup>. Max. cable length between measuring electrode and test station NRA 1-3: 100 m. Please connect screen to connector.

### Connecting line of temperature sensor for detecting the plant temperature

For the connecting line use screened three-core cable, e.g. Ölflex 110 CH, manufactured by Lapp, 3 x 0.5 mm<sup>2</sup>. Max. cable length between temperature sensor and test station NRA 1-3: 100 m. Please connect screen to sensor.

### Only for NRA 1-3 CAN: CAN bus connection, length and size of cables

Note that screened multi-cored twisted-pair control cable is required as 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>.

Cable length	Number of pairs and conductor size [mm <sup>2</sup> ]
125 m	2 x 2 x 0.34
250 m	2 x 2 x 0.5
335 m	2 x 2 x 0.75
500 m	available on demand (depends on bus configuration)
1000 m	

Wire terminal strip **2** in accordance with the wiring diagram.

### Electrical connection

#### NRA 1-3a

With the base part taken off:

1. Loosen the cable glands and pull the connecting lines through the glands.
2. Remove approx. 32 cm of the end insulation of the cable and the screen.
3. Connect the wires to the terminal strips (rear of base part) according to the wiring diagram and use a cable tie for securing the cable bundle to prevent misalignment.
4. Tighten cable glands to achieve a good seal. Use sealing plugs to seal off cable glands that are not used.

#### NRA 1-3e

1. Remove approx. 30 mm of the cable end insulation.
2. Connect the wires to the terminal strips (rear of base part) according to the wiring diagram.



#### Attention

- To prevent the welding together of contacts provide an external slow-blow fuse T 2.5 A for the output contacts.
- When switching off inductive loads, voltage spikes are produced that may impair the operation of control and measuring systems. Connected inductive loads must be provided with suppressors such as RC combinations as specified by the manufacturer.
- **Not for NRA 1-3 CAN:** Install an easily accessible disconnecting switch for the test station in the close proximity of the equipment (EN 61010-1).
- **Not for NRA 1-3 CAN:** Mark the disconnecting switch as isolating device for the test station.
- When installing connecting lines to measuring electrodes and to the temperature sensor make sure they are separated from power cables.



#### Only for NRA 1-3 CAN:

- Wire equipment in series. Star-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).
- If two or more system components are connected in a CAN bus system, provide the first and the last device with a terminating resistor of  $120 \Omega$  (terminal  $C_L/C_H$ ).

The CAN bus system must not be interrupted during operation.

**In the event of an interruption a malfunction alarm is raised.**

### Tools

- Screwdriver, size 1 and 2
- Screwdriver, size 2.5, completely insulated according to DIN VDE 0680-1

## Factory setting

### Test station NRA 1-3

The test station features the following factory set default values:

- Difference between condensate temperature / plant temperature or switchpoint “Banking-up of condensate”: 40 K.
- Maintenance interval: 6 months (not adjustable)
- Code switch **1** Fig. 4: All switches are set to OFF
- Node ID: 5 (only NRA 1-3 CAN)
- Baud rate: 250 kBit/s (length of line: 125 m ) (only NRA 1-3 CAN)

## Commissioning procedure

### Checking electrical connection

Before commissioning the equipment please check:

#### Supply voltage:

Is the test station supplied with the voltage specified on the name plate?

#### Wiring:

Are the measuring electrodes / temperature sensor correctly wired in accordance with the wiring diagram?

### Setting operating mode

Use code switch **1** Fig. 4 switches S1 – S3 to set one of the following seven operating modes.



Toggle switch, white

Mode	S1	S2	S3	Plant temperature	Function	Channels	Remark
	OFF	OFF	OFF		Test		
1	ON	OFF	OFF	yes	Steam loss (conductive) Banking-up of condensate (temperature)	16	Compares condensate temperature with plant temperature
2	OFF	ON	OFF	no	Steam loss Banking-up of condensate	16	Only condensate temperature is measured
3	ON	ON	OFF	no	Steam loss (conductive) Banking-up of condensate (conductive)	8	No temperature measurement
4	OFF	OFF	ON	no	Steam loss	16	No temperature measurement
5	ON	OFF	ON	no	Banking-up of condensate	16	No temperature measurement
6	OFF	ON	ON	yes	Banking-up of condensate	16	Compares condensate temperature with plant temperature
7	ON	ON	ON	no	Banking-up of condensate	16	Only condensate temperature is measured

## Commissioning procedure - continued -



### Note

In mode 3 two measuring electrodes NRG 16-19 (one for banking-up of condensate and one for steam loss) per measuring channel are connected together so that e. g. a float trap can be monitored. For more information see the installation instructions for NRG 16-19, NRG 16-27, NRG 16-28.

In mode 6 and 7 the measuring electrodes NRG 16-27, NRG 16-28 receive the measurements of the condensate temperature only from the integrated temperature sensor.

### Establishing number of measuring channels

Use code switch ❶ Fig. 4, switches S4 – S7 to set the number of measuring channels.

**The switches S8 - S9 must remain in the OFF position. If necessary use switch S10 to activate the CAN bus. See below.**



Toggle switch, white

S4	S5	S6	S7	Channels	S4	S5	S6	S7	Channels
OFF	OFF	OFF	OFF	1	OFF	OFF	OFF	ON	9
ON	OFF	OFF	OFF	2	ON	OFF	OFF	ON	10
OFF	ON	OFF	OFF	3	OFF	ON	OFF	ON	11
ON	ON	OFF	OFF	4	ON	ON	OFF	ON	12
OFF	OFF	ON	OFF	5	OFF	OFF	ON	ON	13
ON	OFF	ON	OFF	6	ON	OFF	ON	ON	14
OFF	ON	ON	OFF	7	OFF	ON	ON	ON	15
ON	ON	ON	OFF	8	ON	ON	ON	ON	16



### Note

If the settings of switches S1 – S7 are changed during operation, the new settings will only be accepted by the test station after the supply voltage has been switched off and on.

### Only for NRA 1-3 CAN: Activating CAN bus

To activate the CAN bus set code switch S10 ❶ Fig. 4 to ON.

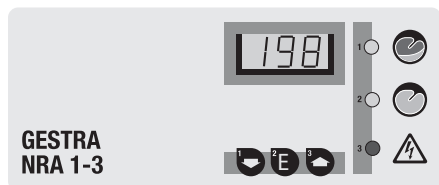
**The switches S8 - S9 must remain in the OFF position.**

### Applying supply voltage

Switch on supply voltage. The seven-segment display and the LEDs will be tested, i. e. all segments and LEDs will be illuminated / are flashing.

## Operation, alarm and test

### Specification of keys and indicators



#### LEDs 1 – 3

- LED 1: Steam loss
- LED 2: Banking-up of condensate
- LED 3: Measuring electrodes NRG 16-27, NRG 16-28 defective (cable disruption, short circuit). Measuring electrodes type NRG 16-19 are not monitored.

**Fig. 5**

#### Function of keys

- Key 1: Decrease value, browse
- Key 3: Increase value, browse
- Key 2 (E): Press briefly: Call up/Execute menu // Continue / Save settings
- Key 2 (E): Press longer: Return to menu, cancel input
- Key 1+3: Press longer: Reset/Delete values (e. g. alarm list + maintenance interval)

### Key to codes on seven-segment display

Code	Description	
The following codes can appear on the seven-segment display even if no key is being pressed:		
SYS	System	SYS changes with plant temperature in °C
E.01	Error	Incorrect configuration due to inadmissible code switch setting
E.02	Error	In mode 2 and 7i the setting for banking-up of condensate is not finished
E.03	Error	Maintenance interval (6 months) elapsed
C.01 – C.16	Channels 1 – 16	Indication of measuring channel
If the E key is pressed:		
HIS	History	Alarm list detailing old alarms
InT	Interval	Remaining time of maintenance interval
CAL	Calibration	Channel calibration in mode 2
dtC (mode 2, 7)	Delta TC	Admissible deviation from condensate temperature in steam trap
dtS (mode 1, 6)	Delta TS	Admissible deviation from plant temperature
dCS (mode 1 – 4)	Delay	Response delay for steam loss
tSt	Test	LEDs and all segments are illuminated
tLO	Temp Low	Single channel: Minimum temperature from which monitoring takes place
GrP	Group	Group temperature
ALL	All channels	Channel selection when calibrating / setting
C.01 – C.16	Channels 1 – 16	Indication of measuring channel
don	done	Confirmation of input when setting parameters
clr	clear	Confirmation of clear command (interval, alarm)
CAN	CAN	Activating CAN bus
br	Baudrate	Changing baud rate
ID	Node ID	Change node ID



## Operation, alarm and test - continued -

### Start

**Mode 1, 6:** After the mains voltage has been switched on and the display test has been finished the system temperature, error messages and current alarms will be indicated.

**Mode 2 to 5 and 7:** After the mains voltage has been switched on and the display test has been finished error messages and current alarms will be indicated.

For more information on the codes HIS, Int and tSt see section “Alarm list, Maintenance interval and Test”, mode 1 to 7 (page 23).

### Only for NRA 1-3 CAN: Setting node ID and baud rate

For the communication with the CAN bus each bus node requires an own address (node ID) and baud rate (speed of data transfer) setting.

The cable length between the bus nodes dictates the baud rate setting.

Cable length	Baudrate
125 m	250 kBit/s (factory setting)
250 m	125 kBit/s
335 m	100 kBit/s
500 m	50 kBit/s
1000 m	20 kBit/s

Please make the following settings:

Briefly press the E key and then key 1 until CAN is indicated on the seven-segment display. Enter the baud rate and node ID settings.

For the node ID you can use numbers between 1 and 127.

If the baud rate and/or the node ID settings are changed the new values will only become active after switching the power supply voltage to the test station off and on again.

<b>Start</b>	Press key E briefly → ← longer	<b>HIS</b>					
		Keys (1) ↓ (3) ↑					
	Press key E briefly → ← longer	<b>CAN</b>	<b>BR</b>	Press key E briefly → ← longer	Change <b>indi- cation</b> keys (1),(3)	Press key E briefly →	<b>don ← CAN</b>
			Keys (1) ↓ (3) ↑				
	Press key E briefly → ← longer	<b>ID</b>	<b>tem- perature</b>	Change <b>tem- perature</b> keys (1),(3)	Press key E briefly →	<b>don ← ID</b>	

## Setting banking-up of condensate, mode 1 to 6

SYS / °C	Press key E briefly → ← longer	HIS						
		Keys (1) ↓ (3) ↑						
		InT						
		Keys (1) ↓ (3) ↑						
		dtS	Press key E briefly → ← longer	ALL	Press key E briefly → ← longer	Change <b>temperature</b> keys (1),(3)	Press key E briefly →	don ← dtS
		Keys (1) ↓ (3) ↑		Keys (1) ↓ (3) ↑				
				C.xx	Press key E briefly → ← longer	Change <b>temperature</b> keys (1),(3)	Press key E briefly →	don ← C.xx
		tlo	Press key E briefly → ← longer		Change <b>temperature</b> keys (1),(3)		Press key E briefly →	don ← tlo

### The precondition for this operating mode is:

- the use of the measuring electrodes NRG 16-27, NRG 16-28 (with integrated condensate temperature measurement at the steam trap) and
- the use of a separate temperature sensor for the measurement of the system/(plant) temperature.

With the parameter **dtS** you can change the difference between the condensate temperature in the steam trap and the plant temperature for all steam traps **ALL** or for each individual trap (C.xx). The factory set default value is 40 K. The value can be changed in increments of 1 K and must be between 0 and 100 K.

With the parameter **tlo** you can set the lower temperature limit between 0 and 100 °C in increments of 5 K. If the condensate temperature is below the temperature limit, the alarms "Banking-up of condensate" and "Steam loss" will neither be indicated nor stored.

## Setting banking-up of condensate, mode 2 to 7

Serial poll	Press key E briefly → ← longer	<b>HIS</b>					
		Keys (1) ↓ (3) ↑					
		<b>InT</b>					
		Keys (1) ↓ (3) ↑					
<b>CAL</b>	Press key E briefly → ← longer	<b>ALL</b>	Press key E briefly →	<b>Temperature</b> automatic poll	auto →	<b>don</b> ← <b>CAL</b>	
		Keys (1) ↓ (3) ↑					
		<b>C.xx</b>	Press key E briefly → ← longer	Change <b>tem-</b> <b>perature</b> keys (1),(3)	Press key E briefly →	<b>don</b> ← <b>C.xx</b>	
<b>dtC</b>	Press key E briefly → ← longer	Change <b>temperature</b> keys (1),(3)		Press key E briefly →		<b>don</b> ← <b>dtC</b>	
		Keys (1) ↓ (3) ↑					
<b>tlo</b>	Press key E briefly → ← longer	Change <b>temperature</b> keys (1),(3)		Press key E briefly →		<b>don</b> ← <b>tlo</b>	

### The precondition for this operating mode is:

- the use of the measuring electrodes NRG 16-27, NRG 16-28 (with integrated condensate temperature measurement at the steam trap).

With the parameter **dtC** the factory set difference of 40 K (admissible condensate undercooling) between the temperature measured at the steam trap and the switchpoint "Banking-up of condensate" can be changed. The value can be changed in increments of 1 K and must be between 0 and 100 K.

In the parameter **CAL** the condensate temperature of all steam traps is polled, the difference **dtC** is subtracted and the result saved.

Starting from the parameter **ALL** the switchpoint "Banking-up of condensate" can be adjusted in increments of 5 K for each individual steam trap (**C.xx**) in order to match the settings optimally to the operating conditions.

The parameter **tlo** allows you to set the lower temperature limit within a range of 0 to 100 °C in increments of 5 K. If the condensate temperature is below the temperature limit, the alarms "Banking-up of condensate" and "Steam loss" will neither be indicated nor stored.

### Setting group temperatures in mode 1 and 6

#### Function

To detect banking-up of condensate the temperature of the condensate in the steam trap is compared with the condensate temperature in the plant. The temperature sensor TRG 5-.. (Pt 100) measures the temperature of the plant.

It is possible to divide the plant in groups. Each group requires the measurement of the group temperature and at least one detection of condensate banking-up. The plant can be split up into a maximum of eight groups.

To measure the group temperature connect a temperature sensor Pt 1000 instead of the measuring electrode NRG 16-27, NRG 16-28. Connect the temperature sensor to the connecting terminals 1, 2 and 3. **Fig 4 5 - 20** Connecting terminals of measuring electrodes

Examples of three groups:

Channel	GrP ON / OFF	Group	Remark
T-Sys		1	Pt 100, plant temperature first group
C.01	OFF	1	
C.02	OFF	1	
C.03	<b>ON</b>	2	Pt 1000, plant temperature second group
C.04	OFF	2	
C.05	<b>ON</b>	3	Pt 1000, plant temperature third group
C.06 - C.16	OFF	3	

#### The prerequisites for operating mode 1 and 6 with measurement of group temperature are:

- the use of the measuring electrodes NRG 16-27, NRG 16-28 (with integrated condensate temperature measurement at the steam trap).
- the use of a separate temperature sensor for the measurement of the system/(plant) temperature.
- the use of temperature sensors Pt 1000, the number of which depends on the planned groups

## Setting group temperatures in mode 1 and 6 - continued -

<b>dtS</b>					
Keys (1) ↓ (3) ↑					
<b>tLO</b>	Press key E briefly → ← longer	Change <b>tem- perature</b> keys (1),(3)	Press key E briefly →	<b>don</b> ← <b>tLO</b>	
Keys (1) ↓ (3) ↑					
<b>GrP</b>	Press key E briefly → ← longer	<b>C.xx</b>			
		Select channel Keys (1) ↓ (3) ↑			
		<b>C.01 - C.16</b>	Press key E briefly →	<b>ON / OFF</b> For switching use keys (1) or (3)	Press key E briefly →
					<b>don</b> ← <b>GrP</b>

Use parameter setting **GrP** to select the channel for measuring the group temperature and activate it (**ON**). The setting **GrP** of the channels that belong to the group must remain **OFF** (factory setting). The display shows only the system (plant) temperature of group 1.

## Setting steam loss, mode 1 to 4

		<b>HIS</b>			
		Keys (1) ↓ (3) ↑			
		<b>InT</b>			
		Keys (1) ↓ (3) ↑			
	<b>dCS</b>	Press key E briefly → ← longer	Change <b>re- sponse delay</b> Keys (1),(3)	Press key E briefly →	<b>don</b> ← <b>dCS</b>

Use parameter setting **dCS** to change the factory-set response sensitivity of 30 sec. for the message "Steam loss". The delay time can be set between 30 and 90 seconds in increments of 15 sec. For the setting the following number code is used:

002 = 30 sec

003 = 45 sec

004 = 60 sec

005 = 75 sec

006 = 90 sec

## Alarm messages

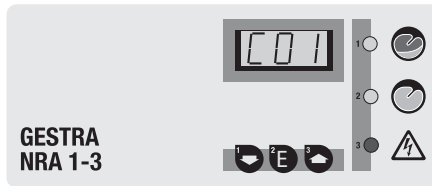


Fig. 7

The alarm messages “Banking-up of condensate”, “Steam loss” and “Malfunction in electrode” (short circuit, parting of cable) will be indicated in the particular operating mode by the LEDs 1 – 3 and the output relay for the collective alarm is energized.

In addition, the seven-segment display shows the number of the faulty steam trap (**C.xx**) . If more than one steam trap are faulty the numbers are indicated one after the other.

Once the cause for the alarm is eliminated, the message is entered into the alarm list.

## Alarm list, maintenance interval and test, mode 1 to 7

SYS / □□□ cycling .	Press key E briefly→ ← longer	HIS	Press key E briefly→ ← longer	Display Keys (1),(3) = browse	Keys (1) + (3) longer → ← auto	clr
		Keys (1) ↓ (3) ↑				
		InT	Press key E briefly→ ← longer	Display	Keys (1) + (3) longer → ← auto	clr
		Keys (1) ↓ (3) ↑				
		tSt	Press key E briefly→ ← longer	Display LEDs + segments	Press key E briefly→	don ← tSt

### Alarm list HIS

Use keys 1 and 3 to browse through the list. The respective alarm messages are indicated by the associated LEDs 1 – 3. If you want to delete a list entry press and hold down the keys 1 and 3, the message **clr** appears, the entry is deleted and the cursor goes to the next entry.

### Alarm list, maintenance interval and test, mode 1 to 7 - continued -

#### Maintenance interval InT

Use parameter **InT** to retrieve information on the remaining run time of the maintenance interval (in days). Hold down the keys 1 and 3 to reset the maintenance interval, the message **clr** appears and the system returns to the previous display.

#### Test tSt

Use parameter **tSt** to check the segments of the seven-segment display and the LEDs 1 – 3. After the test the system returns to the parameter **tSt**.



#### Note

If the key E is used to select a parameter but then no key is pressed, the test station returns to the start window after 10 seconds.

### Malfunctions

The following errors will be indicated on the seven-segment display:

Error code	Error	Remedy
<b>E.01</b>	Incorrect configuration due to inadmissible code switch setting	Check and correct configuration. The test station accepts the new settings only after switching the supply voltage off and on again.
<b>E.02</b>	In mode 2 and 7 the settings for "Banking-up of condensate" is not finished	Finish the setting "Banking-up of condensate"
<b>E.03</b>	Maintenance interval elapsed	Remove and clean measuring electrodes. Reset the maintenance interval in the parameter mode <b>InT</b> .
<b>E.04</b>	Excessively high temperature in test station	Check installation of test station

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



## Removing and disposing of the test station

### 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 staff who - through adequate training - have achieved a recognised level of competence.



### Danger

The terminal strips of the test station NRA 1-3 are live during operation. This presents the danger of electric shock!

Always **cut off power supply** to the equipment before mounting, removing or connecting the terminal strips!

## Removing and disposing of the test station

1. Switch off supply voltage.
2. **NRA 1-3a:** Flip up the base part and remove the terminal strip.
3. Detach the connecting wires from the terminal strips and pull the wires out of the cable glands.
4. Remove the equipment.
5. **NRA 1-3e:** Open the control cabinet and remove the terminal strips.
6. Disconnect the connecting lines from the terminal strips.
4. Remove the equipment.

For the disposal of the test station observe the pertinent legal regulations concerning waste disposal.



### Note

When ordering spare parts please state the material number indicated on the name plate.

# Annex CAN bus telegram

## Directory of objects

Index (hex.)	Subindex (hex.)	Access	Data type	Designation	Description
Tx PDO 1					
2001	1	RO	Uint8	Status	
2001	2	RO	Uint8	Operating mode	
2001	3	RO	Uint8	Number of channels	
2001	4	RO	Uint8	Terminal box	
2001	5	RO	Uint8	TSystem	
2001	6	RO	Uint8		
2001	7	RO	Uint16	Group temperature	
Tx PDO 2					
2001	6	RO	Uint16	Banking-up of condensate	
2001	7	RO	Uint16	Steam loss	
2001	8	RO	Uint16	Malfunction in electrode	
Tx PDO 3					
2003	0	RO	Uint8	T_Channel_0	
2003	1	RO	Uint8	T_Channel_1	
2003	2	RO	Uint8	T_Channel_2	
2003	3	RO	Uint8	T_Channel_3	
2003	4	RO	Uint8	T_Channel_4	
2003	5	RO	Uint8	T_Channel_5	
2003	6	RO	Uint8	T_Channel_6	
2003	7	RO	Uint8	T_Channel_7	
Tx PDO 4					
2004	8	RO	Uint8	T_Channel_8	
2004	9	RO	Uint8	T_Channel_9	
2004	10	RO	Uint8	T_Channel_10	
2004	11	RO	Uint8	T_Channel_11	
2004	12	RO	Uint8	T_Channel_12	
2004	13	RO	Uint8	T_Channel_13	
2004	14	RO	Uint8	T_Channel_14	
2004	15	RO	Uint8	T_Channel_15	

## Annex CAN bus telegram - continued -

### PDO

Ident	Statically mapped objects
TxPDO 1 self	2001 01, 2001 02, 2001 03, 2001 04, 2001 05
TxPDO 2 self	2001 06, 2001 07, 2001 08
TxPDO 3 self	2003 01, 2003 02, 2003 03, 2003 04, 2003 05, 2003 06, 2003 07, 2003 08
TxPDO 4 self	2004 01, 2004 02, 2004 03, 2004 04, 2005 05, 2004 06, 2004 07, 2004 08

### Information content of transmitted CAN bus telegrams (PDO 1)

Identifier NRA 1-3	180 (Hex) + Node ID	
Byte 0	Status	Meaning of the fault bits: Bit 0: Code switch invalid Bit 1: Calibration in mode 2 missing Bit 2: Maintenance interval elapsed Bit 3: Temperature in terminal box too high Malfunction in Pt 100, system temperature
Byte 1	Operating mode	
Byte 2	Number of channels	
Byte 3	Controller output 0..100 %	
Byte 4	Terminal box	
Byte 5	TSystem	

### Information content of transmitted CAN bus telegrams (PDO 2)

Identifier NRA 1-3	280 (Hex) + Node ID
Byte 0 H Byte 1: L	Banking-up of condensate
Byte 2 H Byte 3: L	Steam loss
Byte 4 H Byte 5: L	Malfunction in electrode

## Annex CAN bus telegram - continued -

### Information content of transmitted CAN bus telegrams (PDO 3)

Identifier NRA 1-3	380 (Hex) + Node ID
Byte 0	T_Channel_0
Byte 1	T_Channel_1
Byte 2	T_Channel_2
Byte 3	T_Channel_3
Byte 4	T_Channel_4
Byte 5	T_Channel_5
Byte 6	T_Channel_6
Byte 7	T_Channel_7

### Information content of transmitted CAN bus telegrams (PDO 4)

Identifier NRA 1-3	480 (Hex) + Node ID
Byte 0	T_Channel_8
Byte 1	T_Channel_9
Byte 2	T_Channel_10
Byte 3	T_Channel_11
Byte 4	T_Channel_12
Byte 5	T_Channel_13
Byte 6	T_Channel_14
Byte 7	T_Channel_15









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

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