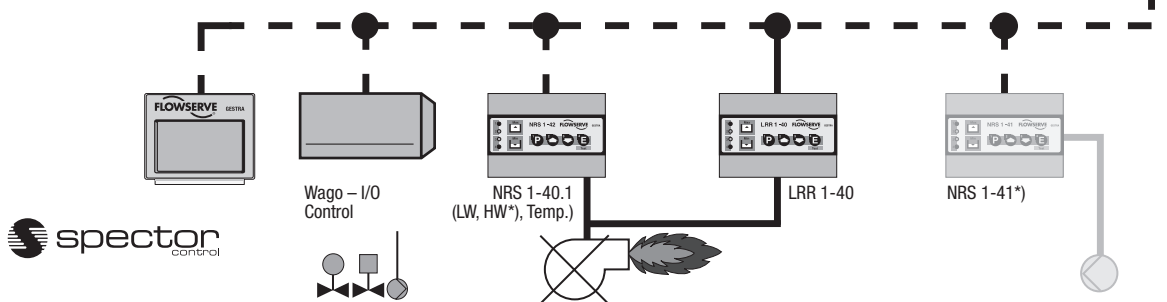


GESTRA Boiler Protection System



*) The system can do without the separate NRS 1-41 if the burner is switched off by the high level function

SPECTOR_{bus}

With these systems, proven technology in the design of electrodes has been alloyed with innovative new level detection and evaluation techniques: All level electrodes feature now special electronic sensor units which, via a bus interface, can exchange data automatically with level controllers or higher-level control systems. The next era in liquid level monitoring and control has dawned.

Features and Benefits of SPECTOR_{bus}

- Patented thermal barrier in cylindrical body above electrode flange
- Terminal box equipped with excess temperature fuse (85 °C)
- Freely accessible connecting terminals
- Large terminal box makes for easy installation
- Standardized response sensitivity $\geq 0.5 \mu\text{S}/\text{cm}$ simplifies stocking and spare part inventories
- Optimum system adaptation/extension without any additional wiring
- Reduced installation effort and material costs, since only a single four-core cable is required between boiler and control cabinet

- Reduced cost of control cabinet
 - only one PG thread
 - only five input terminals
 - only one cable in control cabinet
- Active cable monitoring through message identification for error detection and prioritisation of messages in the event of low-level alarm
- Length of cable between sensor and controller 125 m; max. cable length 1000 m
- Easy to integrate in visual display and automation systems
- Thanks to increased functionality of controllers less component parts required
- **Limitier**
 - Two electrodes but only **one** controller
 - Switch-selectable one/two-electrode system (emergency operation)
 - Instantaneous indication of low level by separate, flashing diode as soon as the liquid falls below low level (simplifies routine testing)
 - After time delay has elapsed, the LEDs stop flashing and are permanently illuminated
 - Separate, instantaneous signal output for low water level
 - Self-test routine **combined with** automatic self-checking of respective output relay contacts

■ GESTRA Boiler Protection System

- up to 4 limiters for one control unit (2 x LW, HW, safety temp. limiter – in any combination).
- **Controller**
 - Less time-consuming calibration of measuring range; 100 % can be adjusted at level 50 %.
 - No additional time relays required for system optimization. Built-in time delays individually adjustable between 1...25 sec. for **each** contact and position.
 - Reduced wiring effort for control cabinet: Only a single four-core cable is required for wiring the panel-mounted control terminal and display unit, since all switchgear controls remain on the mounting panel where their functions are required.
 - **One** operating and control terminal for **all** connected bus nodes.
 - The control terminal features permanent level and conductivity indication according to TRD 401 (second water-level indication) and draft of rules concerning conductivity limiters.
 - Easy parameterization of controls on control terminal or PC.

Level Limitation

Low-Level Limiter

Control unit NRS 1-40 in conjunction with **one** level electrode type NRG 16-40, 17-40, 19-40 or 111-40 constitutes a high-integrity self-monitoring low-level limiter with periodic self-checking and automatic routine testing of output relay contacts. Function:

- Low-level alarm with **one** switchpoint.

The equipment detects min. water level (low-level alarm).

Application in steam and pressurized hot-water boilers according to TRD 401, TRD 602 and TRD 604, EN 12952/..53.

Control unit NRS 1-40 in conjunction with **two** level electrodes type NRG 16-40, 17-40, 19-40 or 111-40 constitutes a high-integrity self-monitoring low-level limiting **system** with periodic self-checking. The control unit features the following function:

- Low-level alarm with **two** switchpoints.

The equipment combination detects low-water level (low-level alarm **system**).

Application in steam and pressurized hot-water boilers according to TRD 604, sheet 1 and 2 (operation without constant supervision for 24/72 hrs.).

The electric device complies with the regulations for safety circuits to DIN VDE 0116 (prEN 50156)

The liquid level data are transferred from the electrode NRG 1...-40 to the control unit via CAN bus, using the CANopen protocol.

The safety temperature limiter type TRG 5-6./TRV 5-40 can be added to the system; for more information refer to page 104.

High-Level-Alarm

Low-Level Limiter

Control unit NRS 1-41 in conjunction with **one** level electrode type NRG 16-41, 17-41 or 19-41 constitutes a high-integrity self-monitoring high-level alarm system with periodic self-checking and automatic routine testing of output relay contacts. Function:

- High-level alarm

The equipment detects the max. water level.

Application in steam and pressurized hot-water boilers according to TRD 401, TRD 602 and TRD 604, EN 12952/..53.

The electric device complies with the regulations for safety circuits to DIN VDE 0116 (prEN 50156).

The liquid level data are transferred from the electrode NRG 1...-41 to the control unit via CAN bus, using the CAN open protocol.

Boiler Protection System

Description

The control unit NRS 1-40.1 in combination with **two** level electrodes NRG 1.-40, the temperature sensor TRG 5-6../TRV 5-40 and, if required, the level electrode NRG 1.-41.1 constitutes a self-monitoring boiler protection system with periodic self-testing and continuous monitoring of the output relays. The control unit features the following functions:

- Low-level alarm with **two** switchpoints

The equipment combination detects the min. water level (low-level limiting **system**).

- Safety temperature limiter

The equipment combination detects the max. allowable temperature.

- High-level alarm

The equipment combination detects the max. water level.

- Or other customized combination.

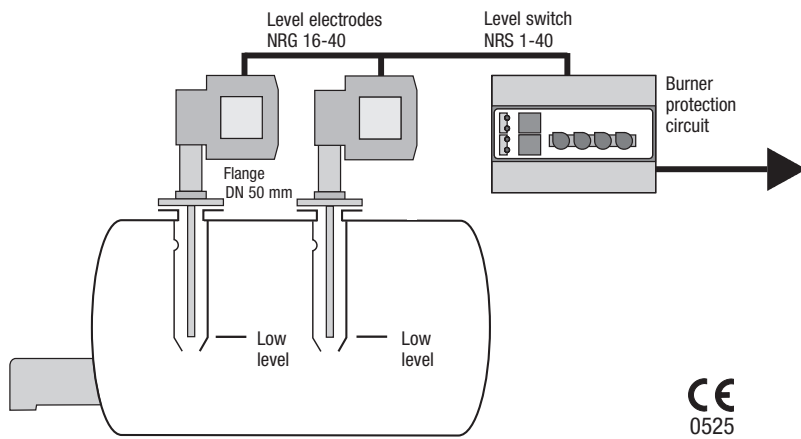
If more than four limiters are required, the control unit NRS 1-40.2 can also be integrated in the system.

Application in steam and (pressurised) hot-water plants in accordance with TRD 604, sheet 1 and sheet 2 (24/72 hrs operation).

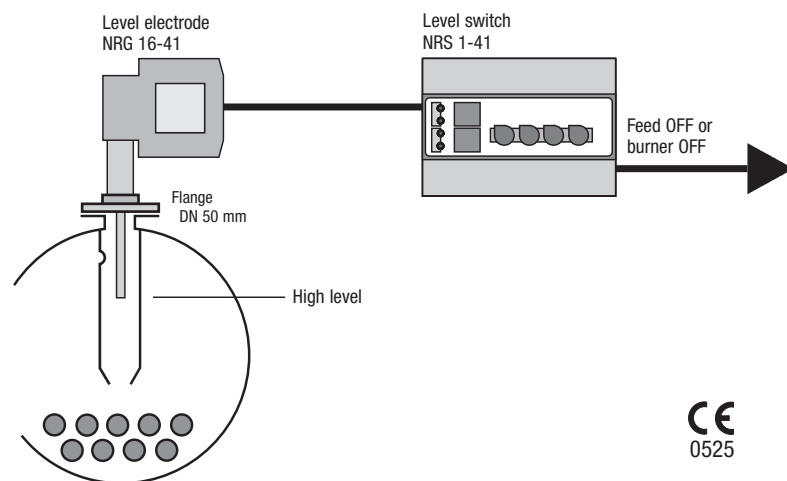
The electrical equipment meets the requirements of the regulations for safety circuits according to DIN VDE 0116 (prEn 50156).

The data of the sensors are transferred to the control unit via CANbus, using the CANopen protocol.

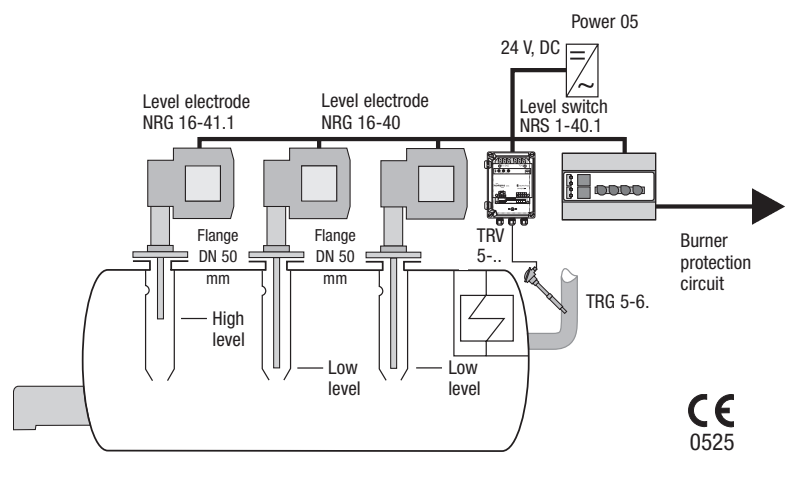
Self-monitoring low-level alarm system to TRD 604 (24/72 hrs without constant supervision)/EN 12952/53



High-level alarm TRD 604, 72h



Self-monitoring boiler protection system TRD 604 24h/72h / EN 12952/53



Type		PN	Stock code
NRG 16-40	1000 mm	40	3514042
NRS 1-40	230 V		3222541
NRG 17-40	1000 mm	63	3544042
NRS 1-40	230 V		3222541
NRG 19-40	1000 mm	160	3574042
NRS 1-40	230 V		3222541
NRG 111-40	1000 mm	320	3574142
NRS 1-40	230 V		

Type approval
TÜV SWB/SHWS 07-403
EG BAF-MUC 02 02 103881 002

If supervision is limited, the system can be operated with one electrode.



Type		PN	Stock code
NRG 16-41	500 mm	40	3524041
NRS 1-41	230 V		3222741
NRG 17-41	500 mm	63	3551241
NRS 1-41	230 V		3222741
NRG 19-41	500 mm	160	3594041
NRS 1-41	230 V		3222741

Type approval
TÜV SWB/SHWS 07-403
EG BAF-MUC 02 02 103881 002



Optional: NRS 1-4.
special voltage: 115 V, 50..60 HZ

Type		PN	Stock code
NRG 16-40	1000 mm	40	3514042
TRG 5-65			2671611
TRV 5-40			2691040
NRG 16-41.1	500 mm	63	3524141
NRS 1-40.1	230 V		3222841
NRG 17-40	1000 mm	160	3544042
TRG 5-65			2671611
TRV 5-40			2691040
NRG 17-41.1	500 mm	63	3551341
NRS 1-40.1	230 V		3222841
NRG 19-40	1000 mm	160	3574042
TRG 5-65			2671611
TRV 5-40			2691040
NRG 19-41.1	500 mm	63	3594141
NRS 1-40.1	230 V		3222841

Optional: NRS 1-40.2, 230 V

3222941

Type approval
TÜV SWB/SHWS STW (STB) 03-413
EG BAF-MUC 03 07 103881 004
TRG 5-6... / TRV see pages 104 – 105

Description

1. Conductivity Measurement

NRG 16-42

The level electrode type NRG 16-42 works according to the conductivity measurement principle. With the NRG 16-42 a maximum of four levels can be signalled in conductive liquids:

- Four levels with one switchpoint each
- High-level alarm, first low-level alarm, pump ON, pump OFF, with one switchpoint each

Use level electrode NRG 16-42 in combination with level switch type NRS 1-42 or other system components. The level data are transferred to the level switch or any other system component via a CAN data bus.

NRS 1-42

Use level switch type NRS 1-42 in combination with level electrode type NRG 16-42 for level monitoring.

The level switch has the following functions:

- Four levels with one switchpoint each
- High-level alarm, first low-level alarm, pump ON, pump OFF, with one switchpoint each

The level data are transferred from the electrode NRG 16-42 to the level switch via a CAN bus.

2. Capacitance Measurement

NRG 26-40

The level electrode NRG 26-40 works according to the capacitance measurement principle. The NRG 26-40 is used for detecting and signalling different levels in conductive and non-conductive liquids:

- Level always within defined measuring range of electrode.

Use level electrode NRG 26-40 in combination with level switch type NRS 2-40 or further system components.

The level data are transferred to the level switch or any other system component via the CAN data bus.

NRS 2-40

Use level switch type NRS 2-40 in combination with level electrode type NRG 26-40 for level control and monitoring. The level switch has the following functions:

- Four liquid levels with one switchpoint each
- High-level alarm, first low-level alarm, pump ON, pump OFF, with one switchpoint each

The level switch NRS 2-40 can be optionally equipped with an actual value output for standard signal 4-20 mA.

The level data are transmitted from the electrode NRG 26-40 to the level switch via a CAN data bus.

If you want to connect a second NRS 2-40 in order to establish additional switchpoints please indicate this when ordering.

NRR 2-40

Use level controller NRR 2-40 in combination with level electrode type NRG 26-40 for level control and monitoring. The level controller has the following functions:

- Two limit values with one switchpoint each (high-level alarm and first low-level alarm)
- Three-position or modulating control within a predefined proportional band
- All contacts feature time delays adjustable between 1 – 25 sec.
- Continuous level monitoring within defined measuring range of the electrode.

The NRR 2-40 features an optional output for standard signal 4-20 mA, which can be used for actual value and/or modulating control. The level data are transferred from the electrode NRG 26-40 to the level controller via a CAN data bus.

URZ 40

As an alternative to the control system via a three-position stepping output, the URZ 40a can be mounted to the control valve in order to provide the control function for the CAN bus.

URB 1 / 2

The URB is a user-friendly control terminal and display unit for use with GESTRA CAN bus systems. With the URB all standard functions of the CAN bus system can be easily called up and adjusted. Furthermore, the URB makes the parameterization of the controller very convenient: The switchpoints and the proportional band can be adjusted by means of the keypad regardless of the actual level. The energizing and de-energizing times of the relays can be customized for the individual switchpoints.

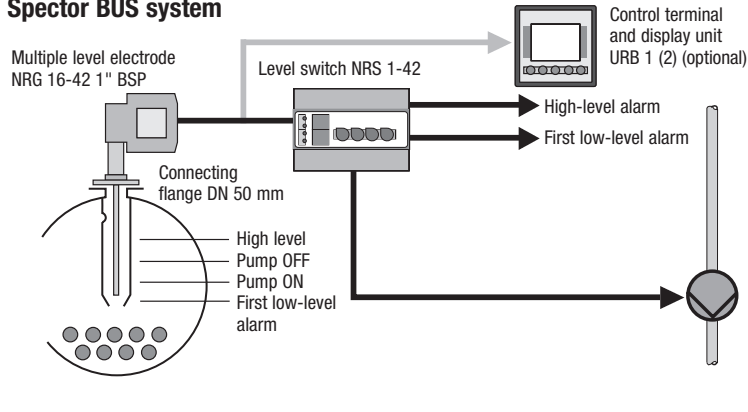
The LCD of the URB displays the following:

- Current liquid level (second water level) (TRD 401, EN 12952, ...53)
- Current conductivity value (TSD control)
- Proportional band of controller (NRR 2-40), (LRR 1-40)
- Switchpoints
 - Position and value of switchpoint LOW LEVEL
 - Position and value of switchpoint HIGH LEVEL
- Position of set point (NRR 2-40), (LRR 1-40)
- Deviation
- Valve position
- Manual/automatic operation
- Current CAN bus address
- Indication of high/low level alarm
- Temperature (URB 2)
- Pressure (URB 2)

Differences between URB 1 and URB 2

Function	URB 1		URB 2	
Display	Graphic display 124 x 64 pixel, 58 x 40 mm		¼ VGA, monochrom 320 x 240 pixel, 115 x 85 mm	
Colour display	No		Optional	
Basic window	Bar chart	Numerical	Bar chart	Numerical
	Level Conductivity	Level Conductivity	Level	Level Conductivity Pressure Temperature
Operation	Via push-button		Via control knob	
Navigation in the menu	Via push-button		Via control knob	
Password protection (to avoid operating errors)	No		Yes	
Software update	No		Yes, Flash	
System freely expandable	No		Yes, software update	
Connection for camera (e. g. local water level indicator)	No		Yes, colour display	

**On-off control with fixed switchpoints
Spector BUS system**



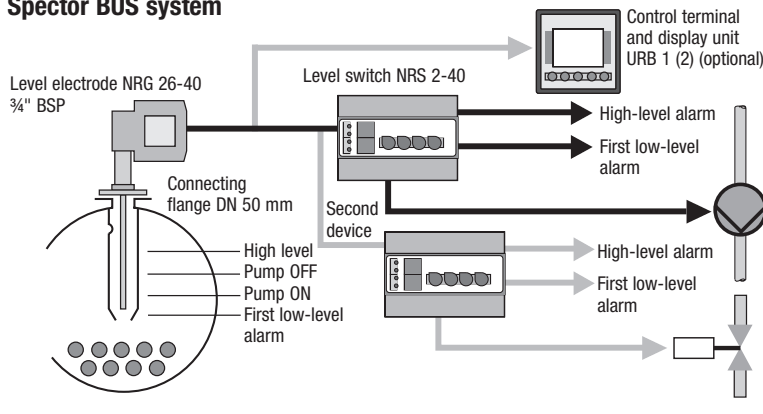
Type		PN	Stock code
NRG 16-42	L = 1000 mm	40	3534248
NRS 1-42	230 V		3222241
Optional: URB VDU			3381043

Optional 115 V, 50..60 Hz

Type approval
TÜV WR 03-399



**On-off control with adjustable switchpoints
Spector BUS system**



Type		PN	Stock code
NRG 16-40	H = 1000 mm	40	3484047
NRS 2-40	230 V		3223041
Optional: URB VDU			3381043

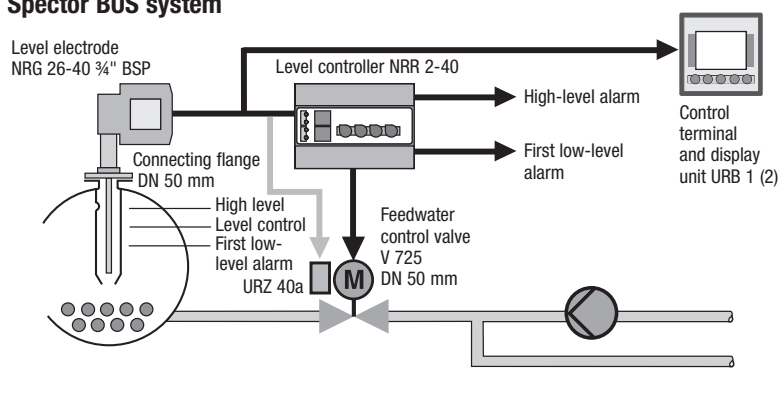
NRS 2-40 optional
115 V, 50..60 Hz

Actual value output 4-20 mA .57
Second device .59

Type approval
TÜV WR 03-399
TÜV SWB/SHWS 07-403



**Modulating control with high-level alarm and first low-level alarm
Spector BUS system**



Type		PN	Stock code
NRG 26-40	H = 1000 mm	40	3484047
NRR 2-40	230 V		3225041
URB VDU			3381043

NRR 2-40 optional
115 V, 50..60 Hz

Actual value output 4-20 mA .57
Output for continuous controller 4-20 mA .58

Type approval
TÜV WR 03-399



Optional: URZ 40a
CANbus-Interface

For flanges see Price List