



**GESTRA Steam Systems**

# **SPECTOR*control***

**EN**  
English

**User's manual 818494-01**

Control, Display & Operating Panel

# Contents

Page

## Important Notes

Usage for the intended purpose .....	6
Safety notes.....	6

## Explanatory Notes

Scope of supply .....	7
Application .....	7
Function .....	8
System design .....	9

## Installation

SPECTOR <i>control</i> .....	10
Bus terminal block (I/O module) .....	10

## Wiring

SPECTOR <i>control</i> .....	10
Bus terminal block (I/O module) .....	10

## Commissioning

Technical requirements.....	11
Start-up behaviour .....	11
Shutdown behaviour .....	11
Factory settings .....	11
System settings .....	12
CAN bus connection.....	13
Remote monitoring .....	14
Integration of third-party equipment.....	14
Using the help function .....	14

## User Interfaces

Description of the browser interface .....	15
Description of the user interface .....	15
Description of the input masks .....	16 – 17
Description of buttons .....	17 – 20
Menu overview .....	21

## System Control

Sequence of set-up .....	22
System .....	23
Date and time setting .....	23
Contrast and backlight setting, cleaning the display, showing/hiding program modules .....	24
Language .....	24
Password .....	25
IP address settings .....	25
Factory settings .....	26
Bus terminal block configuration.....	26

## List of Equipment

Accepted equipment .....	27
--------------------------	----

## Alarm

Alarms .....	28
Alarm details .....	28
Info .....	29
Alarm history .....	29
Acknowledging alarms.....	29
External collective alarm .....	29

## Menus of Inputs/Outputs

CAN 1...10 input .....	30
CAN 1...10 input    NRG 26-40 .....	31
CAN 1...10 input    NRG 26-40    Setup .....	31
CAN 1...10 input    NRG 26-40    Calibration .....	32
CAN 1...10 input    LRG 1x-4x .....	33
CAN 1...10 input    LRG 1x-4x    Setup .....	33
CAN 1...10 input    LRG 1x-4x    Calibration .....	34
CAN 1...10 input    NRG 16-42 .....	35
CAN 1...10 input    NRG 16-42    Setup .....	35
CAN 1...10 output    URZ 40a .....	36
CAN 1...10 output    URZ 40a    Overview .....	36
CAN 1...10 output    URZ 40a    Setup.....	37
CAN 1...10 output    URZ 40a    Signal tracing.....	37
CAN 1...10 output    URZ 40a    Calibrate.....	38

## Menus of Inputs/Outputs continued

Analogue 1...10 input .....	39
Analogue 1...10 input parameter .....	39
Analogue 1...10 input setup .....	40
Analogue 1...10 output .....	41
Analogue 1...10 output parameters .....	41
Digital inputs .....	42
Digital inputs – first value indication .....	43
Digital inputs .....	44
Control equipment .....	45
NRS 1-40.1 .....	45
NRS 1-40/41 setup .....	46
NRS 1-40/41 setup Register limiter 1...4 .....	46
LRR 1-40 .....	47
LRR 1-40 setup .....	47

## Controller Menus

Controller .....	48
Controller setup .....	48
Continuous controller setup .....	49 – 50
Continuous controller softstart .....	50
Continuous controller .....	51
2-position controller setup .....	52
Pump setup .....	53
Pump 1...3 setup .....	53
Valve control .....	54
2-position controller .....	54
Pump status .....	55
3-position controller setup .....	56
3-position controller .....	57
3-element controller .....	58
3-element controller setup .....	58
3-element continuous controller setup .....	59
3-element 3-position controller setup .....	60
3-element continuous/3-position controller .....	61
Intermittent blowdown .....	62
Blowdown setup .....	62
Forced rinsing .....	63

**Boiler Menus**

Boiler .....	64
Maintenance .....	65
Maintenance 1...5 setup .....	65
Datalogs .....	66
Datalog 1...5 setup .....	66
Datalog 1...5 display .....	67
Datalog 1...5 range of representation .....	68
Flowrate .....	69
Quantity of saturated steam .....	69
Quantity of saturated steam 1...5 .....	70
Flowrate 1...5 setup .....	71
Flowrate 1...5 parameter .....	71
Daily log / month log .....	72
IO list (table of data) .....	73
Internal logical links .....	73
Internal logical links 1...10 setup .....	74
Calculations 1...5 .....	75

**System Malfunctions**

Systematic malfunction analysis .....	77
Causes .....	78

**Glossary**

Glossary .....	79 – 81
----------------	---------

## Important Notes

### Usage for the intended purpose

The SPECTOR*control* is a control, display and operating panel with integrated programmable logic controller (PLC).

Apart from GESTRA equipment such as conductive and capacitance level electrodes, temperature limiters and conductivity electrodes, you can also connect equipment provided by other manufacturers (after consultation with GESTRA) and incorporate it into the system.



### Warning

The parameters for the LW and HW alarm electrodes required by law can be indicated and monitored.

The SPECTOR*control* cannot replace the control equipment of legally prescribed limiters such as LW (low-water), HW (high-water) and STL (safety temperature limiters). Such use is considered as improper!

Data can be exchanged safely with equipment tested and approved by GESTRA.

Any type of use different from the usage described above is considered to be improper. The resulting risk is borne by the user alone. The manufacturer hereby expressly rejects any claims for damages resulting from improper use.

### Safety notes

Observe the safety notes of the enclosed specifications concerning equipment and bus terminal blocks. Working methods that jeopardise safety must not be used.

## Explanatory Notes

### Scope of supply

- 1 Display and operating panel with CompactFlash™ min. 256 MB
- 1 Bus terminal block (I/O module) with connector
- 1 User's manual CD "Installation Manual SPECTOR*control*"

### Application

The SPECTOR*control* is designed for the display, parametrisation, monitoring and control of the following components:

- CANopen equipment
- Actuators and sensors

All devices that can be used with SPECTOR*control* are indicated in the list of equipment.

Data is exchanged using the CANopen protocol.

SPECTOR*control* can, if required, be coupled with further SPECTOR*control* equipment.

The display and operation of the SPECTOR*control* can either be effected by means of the graphical touch screen directly or, if remote operation is desired, through use of the Internet browser on the PC.

SPECTOR*control* offers the following service functions:

- Status indication (editable)
- Parameter indication
- Parametrisation of various CAN sensors
- Trend indication (datalog)
- Indication and monitoring of maintenance intervals
- Representation of accumulated quantities
- Compensation of steam quantity signals (only saturated steam)
- Indication of the last 1024 alarm messages in the history
- Collective alarm
- Initial value signalling
- Multiple languages
- Password protection
- Control and monitoring functions
- Parametrisable logical links
- Parametrisable calculations
- Coupling to burner controls (Landis & Staefa, Weishaupt, Hima, Lamtec) with representation and remote operation of the burner data
- Remote operation via Intranet (TCP/IP) or via Internet through UMTS router for example
- Connection to command level through OPC
- Connection to command level through Profibus DP (optional)

### Function

SPECTOR*control* is a control, display and operating panel for boiler management.

The sensors and SPECTOR*control* use the CANopen protocol.

At regular intervals the CANopen devices send data telegrams via CAN bus. The data transfer is in accordance with ISO 11898.

All transferred process data is continuously received and evaluated by SPECTOR*control*. If a connected CANopen device interrupts the data transmitting cycle, an alarm message is generated and a flashing icon is shown on the display.

To establish and monitor the available parameters of CANopen devices you can either use the operating panel directly or remote operation via the Intranet (TCP/IP) from a PC.

The configuration is menu driven. Make sure that you only enter correct parameters since the CAN-open devices do not perform checks regarding consistency and range of values.

SPECTOR*control* saves the adjusted parameters.

Control functions and different software controllers can also be used and parametrised.

Yellow background colours represent parameters as purely display values. Green background colours function as buttons and enable input from the user.



## System design

<b>Bus terminal block (I/O module)</b>	
Max. inputs and outputs	20 digital and 10 analogue
<b>CANopen devices</b>	
Max. number of sensors (without LW, HW and STL)	10
Max. number of actuators	10
<b>Datalogs</b>	
Number of datalogs	5 x 2
<b>Maintenance</b>	
Number of counters (operating hours/switching cycles)	5
<b>Flowrate</b>	
Number of accumulated quantities	5
<b>Steam quantities</b>	
Number of compensated flowrate signals (saturated steam)	5
<b>Links</b>	
Number of logical links that can be freely parametrised	12
<b>Calculations</b>	
Number of calculations (+, -, x, /) that can be freely parametrised	5
<b>Controller</b>	
Number of controllers (continuous/2-position/3-position controllers)	5
Number of 3-element controllers (continuous/3-position controllers)	1
<b>Blowdown control</b>	
Number of controllers	1
<b>Current messages and messages in the history</b>	
Max. number of messages in the history	1024
<b>Password protection</b>	
Number of levels	3

## Installation

### **SPECTOR*control***

Installation in accordance with the enclosed equipment specification of the visual display and operating panel CPC-, EP- or XV-XXX.

### **Bus terminal block (I/O module)**

Installation in accordance with the enclosed equipment specification of the bus terminal block (I/O module).

## Wiring

### **SPECTOR*control***

Wiring in accordance with the enclosed equipment specification of the visual display and operating panel CPC-, EP- or XV-XXX.

### **Bus terminal block (I/O module)**

Wiring in accordance with the enclosed equipment specification of the bus terminal block (I/O module).

# Commissioning

## Technical requirements

All components to be monitored must be connected and operating.

The visual display and operating panel must be provided with a CompactFlash™ card and the power supply must be switched on.

## Start-up behaviour

To commission the display and operating panel, switch on the power supply. First a system test is carried out and operating system WinCE with the relevant drivers boots up.

After that the user program is automatically loaded from the CompactFlash™ and the start menu "Overview" is displayed (duration approx. 1 min.).



### Note

Any fault occurring during start-up will be indicated on the display.

## Shutdown behaviour

As short power supply failure of up to 10 ms will be buffered by the power supply unit. In the event of a longer power failure you have to restart *SPECTORcontrol* in order to restore the power supply.

## Factory settings

The graphical screen masks are configured by GESTRA. All adjustable masks are completely available, no matter whether the indicated instruments are part of the bus system or not. Subsequent expansion or modification is therefore possible at any time.

The scope of the adjusted values and hence the degree of preadjustments depends on whether a preconfigured OEM version is used or whether *SPECTORcontrol* will be connected to an existing bus system and therefore the configuration of the system must be completely new.

If a preconfigured OEM version is used, the built-in components with the adjusted parameters are stored on the CompactFlash™ card.

### System settings

The system adjustments for commissioning are stored on the CompactFlash™ card or in the Internal Storage by GESTRA. They ensure a trouble-free commissioning procedure.

Grey entry fields or symbols are password protected.

In every menu that requires a password you can enter your password. The release of password-protected menus is time limited (default time of 1 hour). After this period of time the release is automatically terminated and the password must be entered again.

The equipment features the following default settings:

- Time: Real-time date and clock (battery-backed)
- Contrast: Contrast = 50 %  
Backlight = 100 %
- Language: English
- IP address settings: 192.168.0.99
- Passwords: Level 1 for operating personnel: #####  
Level 2 for engineering personnel: #####  
Level 3 for commissioning personnel: GESTRA (factory setting)



#### Note

After commissioning we recommend that you use a new password.  
Make sure that the same password is not used twice.  
Max. length of password: 8 characters.

### CAN bus connection

The connection to the CANopen equipment is implemented via the CAN interface.

A D-subminiature plug connector (in accordance with DIN 41652) must be used for the connection cable. Use a multi-core flexible control cable as the supply line.

Note that a screened multi-core twisted-pair control cable is required as a 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	
1000 m	



#### Note

The design and preparation of the data cable is an important factor for the electromagnetic compatibility (EMC) of SPECTOR*control*. Connection should therefore be carried out with special care (see equipment specification of the display and operating panel CPC-, EP- or XV-XXX).

### Remote monitoring

SPECTOR*control* can be operated remotely from a PC. For this purpose a browser (Internet Explorer 5.5 or higher) or the remote client tool on the installation CD must be installed as frontend.

A direct connection to the network/Intranet is implemented via the integrated Ethernet interface using a patch cable (RJ45). Alternatively, the connection can also be established via hub/switch.

There is a hub/switch in the ISDN modem/router which is available as an option. In this case an additional remote connection can be made directly via an ISDN RDT connection.

The IP address of SPECTOR*control* can be obtained from your system or network administrator.

The IP address must be uniquely defined in the network. The setting is made in the Autoexec.cmd on the flash card via an FTP connection or CF card reader. If this is not required, this entry can be hidden. You must then make sure in future that the network cable is inserted as WinCE resets the IP address.

You can find further information on the installation CD in "Remote Maintenance" or the "Quick Installation Guide".

### Integration of third-party equipment

Third-party equipment such as Profibus and MODBus can – after prior consultation with GESTRA – be directly connected to SPECTOR*control*.

### Using the help function

You will find the help function of the screen mask in the top right corner of the menu bar.



When you press the button with the question mark, a new window will appear, giving additional information on the current screen mask. The window is closed by the user.

# User Interfaces

## Description of the browser interface

SPECTOR*control* can be operated remotely via Internet browser or remote client included in the delivery (can be found on the installation CD).

For the remote access via Intranet a valid IP address is required.

For information on how to establish an IP address, see chapter System, Change **IP menu**.

To call up the page enter <http://IP address>.

To show the user interface of SPECTOR*control*, press the button WebEPAM.

To confirm the authentication that follows, press "OK".

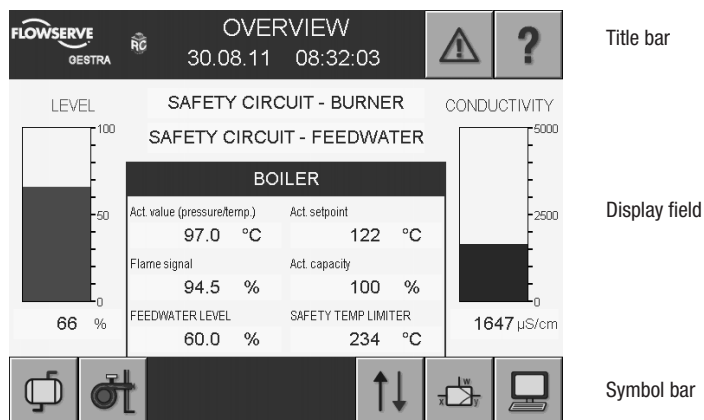


### Note

For security reasons, only one logged-in user can access the system via browser. The direct operation of SPECTOR*control* is still possible, but a simultaneous operation (local and remote access) should be avoided.

## Description of the user interface

The user interface consists of three areas:



The title bar shows the company logo, the title of the menu and two buttons. All other menus have three buttons.

The display field changes its appearance according to the indicated menu.

The symbol bar shows the available functions, depending on the indicated menu.

## Description of the input masks

The input masks are designed for entering values without a keyboard.

Data is input directly on the monitor via a touch screen panel and remote input is effected by clicking on the user interface of the input masks.

For the input mask, only the indicated (limited) set of characters can be used.

Only upper case letters are indicated and used (case insensitivity).

A plausibility test is not carried out.

Cur.: LEVEL

1	2	3	4	5	6	7	8	9	0
Q	W	E	R	T	Z	U	I	O	P
A	S	D	F	G	H	J	K	L	
Y	X	C	V	B	N	M	-	✓	

[Empty input field] [Touch icon]

The input mask is for entering units/dimensions.

When changing the language, country-specific units (e.g. temperature) will not be changed.

A plausibility test is not carried out.

Cur.: %

°	z	3	%	/	▲	-
μ	a	b	c	e	f	g
h	i	k	l	m	n	r
t	C	F	O	P	S	U

[Empty input field] [Touch icon]

For the input mask, only the indicated (limited) set of characters can be used.

Minimum and maximum values are indicated above and below the current entry.

Values that are not within the admissible range will not be accepted.

Min.: 0.00  
Cur.: 100.00  
Max.: 99999.00

7	8	9
4	5	6
1	2	3
.	0	+/-

[Empty input field] [Touch icon]

The mask is used for selecting the type of manual operation.

In the 3-button menu, the controller motors continuously to the selected end position. The changing value of the manipulated variable is optically indicated in the previous menu and the selected mode of operation is shown by the icon of the button. Press the button "Stop" to interrupt or terminate the process.

Manual [Touch icon]

Open

Stop

Closed












### Description of the input masks continued












The mask is used for selecting the type of manual operation.

In the 2-button menu, the controller motors continuously to the selected end position. The attained mode of operation is optically indicated in the previous menu. The selected mode of operation is indicated by the icon on the button.













### Description of buttons

Button	Description
	<b>Return</b> to start menu
	<div> <div>grey</div> <div>= no alarm activated</div> </div> <div> <div>Current <b>alarm indication</b> red</div> <div>= alarm acknowledged but still activated</div> </div> <div> <div>flashing</div> <div>= alarm activated and not acknowledged</div> </div>
	Indicate <b>help texts</b> for current page
	Go to maintenance logs
	Go to <b>datalogs (trends)</b>
	Go to <b>quantities logs</b>
	Open the <b>configuration mask</b>
	Go to the <b>system settings</b>
	<b>Password entry</b>










## Description of buttons continued

Button	Description
	<b>Acknowledge alarm</b>
	<b>Quit</b> current menu
	Go to source (origin) of <b>malfunction message</b>
	Indicate <b>alarm details</b>
	<b>Delete</b> all history messages ( <b>waste bin</b> ), <b>delete</b> electrodes and limiters
	<b>Filter</b> the alarm history
	<b>Sort</b> the alarm history
	Go to the <b>malfunction history</b> of the burner
	Go to collective error alarm configuration
	<b>Acknowledge/apply</b>
	<b>Backspace</b>
	Go to the <b>burner menu</b>

## Description of buttons continued

Button	Description
	Go to the <b>boiler menu</b>
	Go to the <b>controller menu</b>
	Indicate the <b>3-element controller menu</b>
	Indicate <b>blowdown</b>
	Indicate <b>multiple pump control</b>
	<b>Continuous blowdown valve forced rinsing menu</b>
	Go to the <b>I/O menu</b>
	Go to the menu of the <b>control equipment</b>
	Indicate the <b>CAN inputs</b>
	Indicate the <b>CAN outputs</b>
	Indicate the <b>analogue inputs</b> (I/O modules)
	Indicate the <b>analogue outputs</b> (I/O modules)

## Description of buttons continued

Button	Description
	Indicate the <b>digital inputs</b> (I/O modules)
	Indicate the <b>digital outputs</b> (I/O modules)
	<b>Calibrate</b>
	<b>Delete</b>
	Configurable <b>logical links</b> (AND, OR, SR with timer: Ton, Toff, Tpuls)
	Configurable calculations (+, -, x, /)
	Indicate the <b>configurable data table</b>
	<b>Forwards/backwards</b> in steps of 3 min (in datalog)
	<b>Forwards/backwards</b> in steps of 10 min (in datalog)

### Menu overview

The parameters have individual setting options, which are password protected.

Press  on one of the following pages and enter your password.

- The titles can be given new names.
- The bar graphs can be assigned to CAN participants.
- The limiters are shown in the upper area after switching on.
- Six signals can be shown in the centre.  
Select the desired type or hide the signal.
- To show the current values  
or configuration of the boiler, press
- To show the current values or configuration of the  
burner, if connected, press
- To show values or configuration of  
inputs/outputs, press
- To show or configure values of  
the controller, press
- To go to the system settings menu,  
press



#### Note

The level display and the conductivity can be assigned for example to the bar graphs on the left and right of the overview. This is not mandatory for the conductivity. The temperature or level of a second level electrode for feedwater can be assigned to the bar graphs.

Use



, which is not shown in this menu, to jump from all submenus directly to the menu **Overview**. If no inputs are made within a certain period of time, the system automatically returns to the overview menu.

## System Control

### Sequence of set-up

Before starting the set-up procedure, make sure that all devices are interconnected via CAN bus. The CANopen protocol is used for the data exchange between the equipment groups.

To be able to access the CANopen equipment of the plant you must first check and, if necessary, modify the basic settings.

Preconfigured installations will be completely parametrised by GESTRA. The data is stored on the CompactFlash™ card. Modifications are therefore not necessary.

For a subsequent installation or expansion of *SPECTORcontrol* follow the configuration steps described below.



#### Note

Any modification of the basic settings has a direct effect on the boiler monitoring system and the operation functions.

We recommend the following configuration sequence:

1. Check/configure system settings
2. Check/configure connected CANopen equipment
3. Check/configure connected analogue equipment (I/O module)
4. Check/configure connected digital equipment (I/O module)
5. Check/configure controller
6. Check/configure boiler parameters
7. Check/configure burner parameters
8. After finishing the configuration, restart the system  
(switch power supply off and on)  
(Only applicable if settings of CANopen equipment – cf. item 2 – were modified)



#### Note

*SPECTORcontrol* does not have its own on/off switch.

To turn off, disconnect the power supply in the control cabinet or directly at the equipment by unplugging the mains plug (24 V DC).

### System

To configure the system, press the button  in the menu **Overview**.





- To change the date and time, press the button **Set time**.
- To change the contrast and brightness of the screen, press the button **Change contrast**.
- To change the language, press the **Language** button.
- To change the password, press the button **Change password**.
- To change the IP address, press the button **Change IP**.  
Changes only take effect if there is a network cable connected.
- To save or restore the default plant configuration, press the button **Factory settings**.
- To read out the CAN bus, press the button **Hardware info Canbus**.





#### Note

All changes to the configuration take immediate effect. Changes to the IP address and the node ID only apply or become effective after a restart.

### Date and time setting

1. In the menu **System**, press the button **Set time**.
2. The date/time setting is password protected. Press  and enter your password.
3. Press  and  above and below the date and time settings to change the individual values. The values are changed in steps of 1.
4. To accept the date and time settings, press .

### Contrast, backlight, cleaning the display, showing/hiding program modules

1. In the **System** menu, press the button **Calibrate display/clean/view**.
2. To change the contrast (difference between dark and light areas of the screen) press  and  to the left and right sides of the fixed values of 40 % and 50 %.  
The current value takes immediate effect and is highlighted in yellow.
3. The backlight (brightness of the display) can be set to 50 % or 100 % by pressing the respective button. The selected value takes immediate effect and is highlighted in yellow.
4. Press the button **Touchpanel cleaning**, followed by the button **Start** to activate the screen cleaning. By doing this, the control panel becomes inactive and the display can be cleaned within a timeframe of 30 seconds.
5. Press the **Visible buttons** button to show/hide program modules that are not required.
6. When using a resistive touch screen, an additional button, **Calibrate resistive touch**, appears in the lower operating bar. Press this to enable display calibration.

### Language

1. In the menu **System** press the button **Language**.
2. The language setting is password protected. Press  and enter your password.
3. To change the language, press the button with the relevant national flag. The selected language takes immediate effect and is shown in the menu bar.





#### Note



Additional languages can be used.



### Password

1. Press the button **Change password** in the menu **System**.
2. The menu **Password** is password protected. Press  and enter your password.
3. According to the level of authorisation, one or more green input fields are shown. An asterisk appears in the input field for each character you enter.
4. Select the input field that you want to change.
5. The current value appears as plain text in the input mask. The on-screen keyboard can be used to overwrite or modify this text. Note that a maximum of 8 characters can be entered.
6. Confirm the input of the password by pressing the button .

### IP address settings


1. Press the button **Change IP** in the menu **System**.
2. The menu **Change IP** is password protected. Press  and enter your password.
3. Select the input field that you want to change.
4. The current value appears in the input mask. The on-screen keyboard can be used to overwrite or modify this text.
5. Confirm the input of all IP addresses by pressing .



#### Note

All changes to the configuration take immediate effect.

### Factory settings

1. Press the button **Factory settings** in the menu **System**.
2. The menu **Factory settings** is password protected.  
Press  and enter your password.
3. According to the level of authorisation, one or more yellow input fields with the “Saved on” date are shown.
4. Press the buttons of the settings that you want to save or load.




#### Note

By using “Factory settings”, all settings, parameters, links, etc. can be stored and, if necessary, read back.

The accumulated maintenance and flowrate data will not be overwritten.  
All adjusted parameters remain stored.

### Bus terminal block configuration

1. Press the button **Bus terminals/IO-module** in the menu **System**.
2. The menu **Bus terminals/IO-module** is password protected.  
Press  and enter your password.
3. The physical quantity of the individually inserted Wago IO channels is shown and parametrised. If the number inserted is smaller than the maximum possible expansion, the channels become inactive (greyed out) in the relevant menu.
4. Use the button **Overview** to jump directly to the inputs/outputs to be adjusted.
5. Use the button **Show bus terminals** to go to the overview of the bus terminal blocks that can be connected to the system. Press one of the buttons to go to the relevant connection diagram. Press the connection diagram to close it.



#### Note

Configuration of the quantity of Wago IO terminals is intended to prevent misconfiguration. Quantities entered that are below the maximum configuration result in a greyed-out image in the relevant selection menu.

## List of Equipment

### Accepted equipment

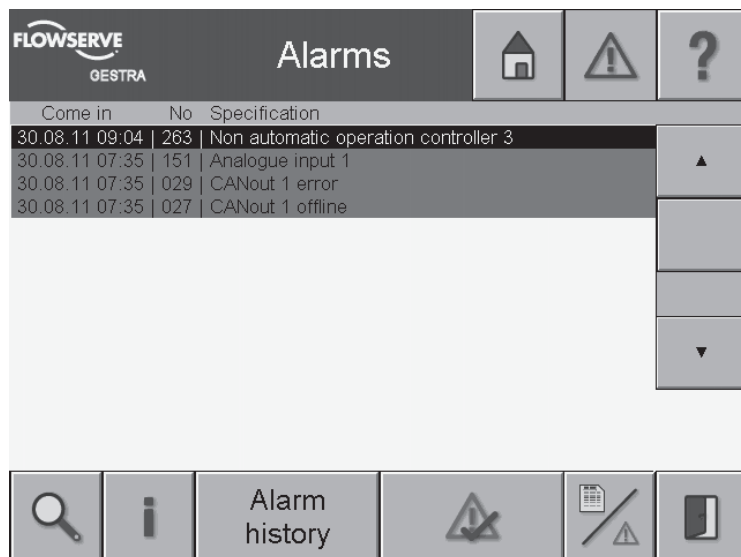
<b>GESTRA</b>	<b>Function</b>
NRS 1-40, NRS 1-40.1, NRS 1-40.2	Level switch
NRS 1-41	Level switch
LRR 1-40	Conductivity controller/limiter
LRG 1X-40, LRG 16-41	Conductivity electrode
NRG 1X-40	Level electrode
NRG 1X-41, NRG 1X-41.1	Level electrode
NRG 16-42	Level electrode
NRG 26-40	Level electrode
ORT 6	Oil/turbidity measuring transducer
TRV 5-40	Temperature measuring transducer
EF 1-40	Actuating drive
URZ 40a	Actuating drive – control unit
<b>Third-party companies</b>	
Jumo CANtrans p	Temperature sensor
Jumo CANtrans T	Temperature sensor
<b>Digital inputs</b>	
WAGO type 750-400	24 V
<b>Digital inputs</b>	
WAGO type 750-513	Floating relay contact 2A
<b>Analogue inputs</b>	
WAGO type 750-466/000-200	4-20 mA
WAGO type 750-476	-/+ 10 V
WAGO type 750-461/003-000	PT 100/ 1000
WAGO type 750-461/000-002	10R-1k2
<b>Analogue outputs</b>	
WAGO type 750-554	4-20 mA
<b>Other equipment</b>	
WAGO type 750-347	Bus coupler
WAGO type 750-602	Feeding module
WAGO type 750-600	End module

## Alarm

### Alarms

To view the alarm messages, press the button .

The menu **Alarms** shows a list of all current alarm messages.



Come in	No	Specification
30.08.11 09:04	263	Non automatic operation controller 3
30.08.11 07:35	151	Analogue input 1
30.08.11 07:35	029	CANout 1 error
30.08.11 07:35	027	CANout 1 offline

### Alarm details

In the menu Alarms, press the button .

1. The alarm information states the alarm number, a short description of the cause, and the time when the alarm was triggered, eliminated and acknowledged.
2. The alarm text appears over two lines.  
Top line: Name of equipment  
Next line(s): Reason for the alarm message




#### Note

The alarm details refer to the alarm marked in black in the menu **Alarms**.






## Alarm continued

### Info

Use the button  to go to the screen for the cause of the alarm.

### Alarm history

Press the button Alarm history in the menu **Alarms**.

1. The menu Alarm history is partially password protected. Press  and enter your password.
2. The alarm information in the display states the time when the alarm was triggered, eliminated and acknowledged, the alarm number and a short description of the cause.
3. To select an alarm message, select the corresponding line. The selection is highlighted in black.
4. To delete all alarms that are no longer relevant, press .
5. To view further details of an alarm, press .  
The menu **Alarm details** appears.
6. To filter alarms, press .  
The following filters are available:  
**All alarms, Only active alarms, Not acknowledged alarms** and **Active but not acknowledged alarms**.
7. To sort the alarms press .  
You can sort by **Alarm in** (FIFO or LIFO) or by **Priority**.

### Acknowledging alarms

Use button  to acknowledge the current alarms.

### External collective alarm

In the menu Alarms, press the button .

An external warning light, an alarm horn and reset button can be assigned to the alarm.  
The connection is made via digital inputs and outputs.

## Menus of Inputs/Outputs

### CAN 1...10 input

To adjust the inputs/outputs, press the button  in the menu **Overview**.

1. The green input fields list the names of the current CAN inputs. Active inputs are indicated on the left by a yellow number. A node ID conflict is indicated by a mark at the left side of the ID setting. To the right of this, the currently measured value, the associated unit and the graphical representation are shown. Current alarms are indicated for each individual input by a mark at the left side of the graphical representation.
2. To change or set the node ID, select the green input field. A pull-down menu appears with the possible CAN participants. If an input is already configured, the name is shown in the input field. Select the input field to call up the corresponding menu directly.

FLOWERVE GESTRA		CAN 1..10 input				
①	LEVEL	ID: 41	66.00	%		
②	CONDUCTIVITY	ID: 51	1650.40	µS/cm		
③	FEEDWATER LEVEL	ID: 21	60.00	%		
④	SAFETY TEMP LIMITER	ID: 4	234.00	°C		
⑤		ID: 0	0.00			
⑥		ID: 0	0.00			
⑦		ID: 0	0.00			
⑧		ID: 0	0.00			
⑨		ID: 0	0.00			
⑩		ID: 0	0.00			

- To show the control equipment, press 

- To call up the CAN outputs, press 

- To show the analogue inputs, press 

- To call up the analogue outputs, press 


- To show the digital inputs, press 

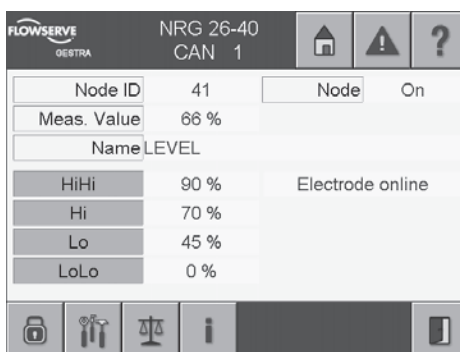
- To call up the digital outputs, press 

### CAN 1...10 input NRG 26-40

1. Select a green input field in the menu of the CAN inputs.
2. If a CAN input is already parametrised, a relevant status screen like this is shown; in this example, the capacitive level electrode NRG 26-40.
3. The setup menu is password protected.

Press  and enter your password.

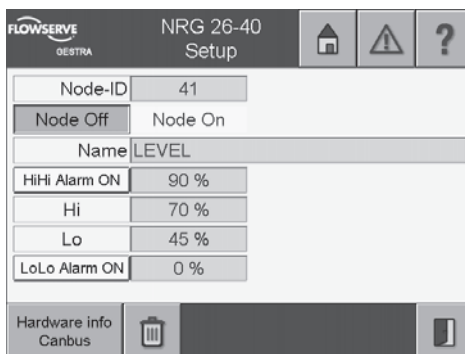
4. To get to the following setup menu, press the  button.



Node ID	41	Node	On
Meas. Value	66 %		
Name	LEVEL		
HiHi	90 %	Electrode online	
Hi	70 %		
Lo	45 %		
LoLo	0 %		

### CAN 1...10 input NRG 26-40 setup

1. To enter or change the node ID, select the green input field. The standard factory setting is 41. When using more than one NRG 26-40, a different node ID must be set here and in the electrode.
2. Use the button **Node On/Off** to activate or deactivate the input.
3. To name the CAN inputs, select the green input field.
4. In the input mask, the on-screen keyboard can be used to enter or change the name.
5. To change the limit values, select the relevant input field.
6. In the input mask, the on-screen keyboard can be used to enter or change the value.



Node-ID	41
Node Off	Node On
Name	LEVEL
HiHi Alarm ON	90 %
Hi	70 %
Lo	45 %
LoLo Alarm ON	0 %




#### Note

The settings for the HiHi and LoLo values can be used for alarms and the Hi and Lo values can be used for switchpoints of 2-position controllers. All limit values can be used as input parameters in the menu "Logical links". It is also possible to control digital outputs with the limit values entered here.

If all values from HiHi to LoLo are set to 0, limit value monitoring is deactivated.

If HiHi/LoLo alarms are switched off, no entry is made in the alarm log.

### CAN 1...10 input    NRG 26-40 Calibration


1. In the menu for CAN 1...10 input ( NRG 26-40 ), press button  .

2. The conductive level electrode NRG 26-40 can be calibrated on this screen.

3. The adjustment should be carried out if possible with both 0 % and 100 % values for the fill level.

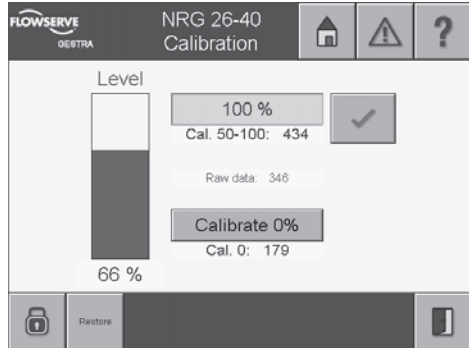
Alternatively, the adjustment can be carried out with 0 % and a defined value, > 50 % fill level. In this case, the 0 % value must be adjusted first.

4. Start the fill level that relates to 0 % (sight-glass). Wait until the level has stabilised and then press the button “Calibr. 0%”. This button stores the relevant raw data values.

5. Now start a fill level, > 50 % (sightglass). Wait until the level has stabilised. Enter the fill level value in the green input field and press the button  .

The interpolated raw data value for 100 % is shown under the input field.

6. Use the button “Restore” to go to a service menu. The calibration data can be transferred to the electrode when repairing or after changing electrodes (of an identical type) without starting the fill level again.













### CAN 1...10 input LRG 1x-4x

1. Select a green input field in the menu of the CAN inputs.
2. If a CAN input is already parametrised, a relevant status screen like this is shown; in this example the conductivity electrode LRG 16-40.
3. The setup menu is password protected.

Press  and enter your password.






4. To get to the following setup menu, press the

button  .

FLOWERVE		GESTRA		LRG 1x-4x		CAN 2		  	
Node ID	51	Node	On						
Meas. value	1652 $\mu\text{S/cm}$	Temperat.	26 $^{\circ}\text{C}$						
Name		CONDUCTIVITY							
Compens.	Linear	2.1 $\text{\%/}^{\circ}\text{C}$							
Electrode online		HiHi	2500 $\mu\text{S/cm}$						
		Hi	1800 $\mu\text{S/cm}$						
		Lo	1600 $\mu\text{S/cm}$						
		LoLo	10 $\mu\text{S/cm}$						
   									

### CAN 1...10 input LRG 1x-4x setup

1. To enter or change the node ID, select the green input field. The standard factory setting is 51. When using more than one LRG 16-40, a different node ID must be set here and in the electrode.
2. Use the button **Node On/Off** to activate or deactivate the input.
3. To name the CAN inputs, select the green input field. In the input mask, the on-screen keyboard can be used to enter or change the name.
4. To change the range values and limit values, select the relevant input field.
5. In the input mask, the on-screen keyboard can be used to enter or change the value. The electrode delivers a measured value between 0.5 and 12,000  $\mu\text{S/cm}$ . The range specification is only relevant for illustrating bar graphs or datalogs.

FLOWERVE		GESTRA		LRG 1x-4x		Setup		  	
Node-ID	51								
Node Off	Node On								
Name		CONDUCTIVITY							
Range 100%	5000 $\mu\text{S/cm}$	HiHi Alarm ON	2500 $\mu\text{S/cm}$						
		Hi	1800 $\mu\text{S/cm}$						
		Lo	1600 $\mu\text{S/cm}$						
Range 0%	0 $\mu\text{S/cm}$	LoLo Alarm ON	10 $\mu\text{S/cm}$						
Hardware info		Canbus		 					




#### Note

The settings for the HiHi and LoLo values can be used for alarms and the Hi and Lo values can be used for switchpoints of 2-position controllers. All limit values can be used as input parameters in the menu "Logical links". It is also possible to control digital outputs with the limit values entered here.

If all values from HiHi to LoLo are set to 0 %, limit value monitoring is deactivated.

If HiHi/LoLo alarms are switched off, no entry is made in the alarm log.

## CAN 1...10 input    LRG 1x-4x calibration

1. In the menu for CAN input 1...10, press the button .

2. The conductivity electrode LRG 16-40 can be calibrated on this screen.

3. When the compensation is switched OFF the absolute conductivity is indicated.

4. Autoscan:

For this method a characteristic conductivity/temperature curve of the plant (Auto curve) is used for temperature compensation. However, a characteristic Auto curve must be recorded first.

To do this, press the Autoscan button to start recording the curve.

Now increase the steam boiler to the highest operating pressure.

During the heating process, the temperature and conductivity values are recorded at every 10 °C above 100 °C. After 25 values have been recorded or if "Compensation Off" is selected, the recording is ended and the auto curve is saved.

The TK (AUTO) process is suitable for steam boilers operating with variable pressure.

5. Auto active:

When "Auto active" is selected, compensation is carried out according to the curve indicated by "Autoscan".

6. Standard curve:

Since conductivity is not a linear function of temperature over a larger temperature range, various conditioning agents and different basic conductivities were used in order to ascertain empirical conductivity/temperature curves. These curves are stored as standard curves and can be used for temperature compensation. TK (NORM) is suitable for steam boilers operating with variable pressure, which means that the boiler does not have a fixed working pressure (e.g. low load 10 bar, full load 15 bar).

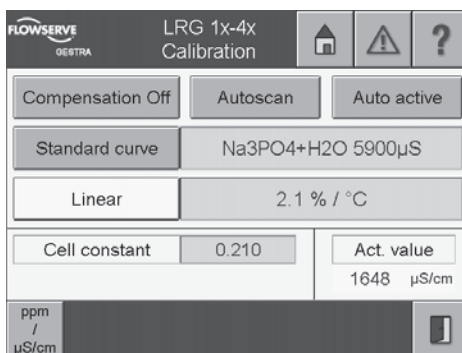
7. Linear:





To ensure that the readings are based on 25 °C, set the TK value to between 1.6 and 3.0 %/°C (default is 2.1 %/°C). This setting permits the linear temperature compensation of the measured value over the whole measuring range. This method is usually applied for steam boilers operating at a constant service pressure. After the TK is set and the service pressure is reached, use a calibrated conductivity meter to measure the conductivity of the boiler water and compare the reading with the indicated conductivity value. If the reading differs from the indicated conductivity, change the TK setting until they tally.

8. Cell constant:

The cell constant is a geometric quantity characteristic of the conductivity electrode and is taken into account when calculating the conductivity. However, this constant may change during operation, e.g. due to dirt deposits accumulated on the measuring electrode.

If a reference measurement yields a result that differs from the indicated conductivity value, check the temperature compensation first. Only if the temperature coefficient setting is no longer sufficient for a correct compensation should you modify the cell constant. In this case, change the cell constant until the reading and the indicated conductivity match.



FLOWSERVE GESTRA		LRG 1x-4x Calibration		  	
Compensation Off		Autoscan		Auto active	
Standard curve		Na3PO4+H2O 5900µS			
Linear		2.1 % / °C			
Cell constant		0.210		Act. value	
				1648 µS/cm	
ppm / µS/cm					

### CAN 1...10 input NRG 16-42

1. Select a green input field in the menu of the CAN inputs.
2. If a CAN input is already parametrised, a relevant status screen like this is shown; in this example the four-rod level electrode NRG 16-42.
3. The setup menu is password protected.

Press  and enter your password.

4. To show the setup menu press the button



### CAN 1...10 input NRG 16-42 setup

1. To enter or change the node ID, select the green input field. The standard factory setting is 21. When using more than one NRG 16-42, a different node ID must be set here and in the electrode.
2. Use the button **Node On/Off** to activate or deactivate the input.
3. To name the CAN inputs, select the green input field. In the input mask, the on-screen keyboard can be used to enter or change the name.
4. To change the limit values, select the relevant input field. These limit values are only for adjusting the numerical representation to the actual lengths of the four rods.
5. The level electrode NRG 16-42 only works when used in water with a minimum electrical conductivity. If the electrical conductivity of the water is  $< 10 \mu\text{S}/\text{cm}$  at  $25^\circ\text{C}$ , switch the sensitivity to the  $0.5 \mu\text{S}/\text{cm}$  range.




#### Note

The switchpoint of the HiHi and LoLo rods can be used for alarms and the switchpoint of the Hi and Lo rods can be used for parametrising the 2-position controller. All switchpoints can be used as input parameters in the menu "Logical links". It is also possible to combine digital outputs with these switchpoints.

If HiHi/LoLo alarms are switched off, no entry is made in the alarm log.

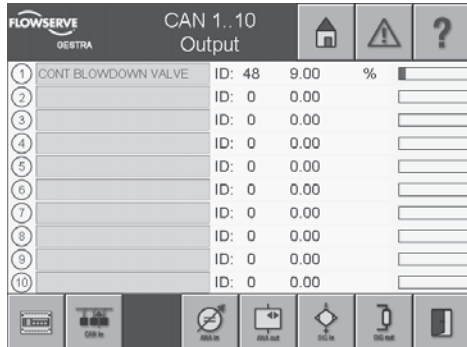
### CAN 1...10 output URZ 40a

To adjust the inputs/outputs, press the button  in the menu **Overview**.

1. The names of the current CAN outputs are listed in the green input fields. Active inputs are indicated on the left by a yellow number. A node ID conflict is indicated by a mark at the left side of the ID setting. To the right of this, the currently measured value, the associated unit and the graphical representation are shown. Current alarms are indicated for each individual input by a mark at the left side of the graphical representation.

2. To reconfigure an output, select the green input field. A pulldown menu appears with the possible CAN participants. If an output is already configured, the name is shown in the input field.

Select the input field to call up the corresponding menu directly.



	Node ID	Value	Unit	Graphical Representation
1	48	9.00	%	
2	0	0.00		
3	0	0.00		
4	0	0.00		
5	0	0.00		
6	0	0.00		
7	0	0.00		
8	0	0.00		
9	0	0.00		
10	0	0.00		


### CAN 1...10 output URZ 40a overview

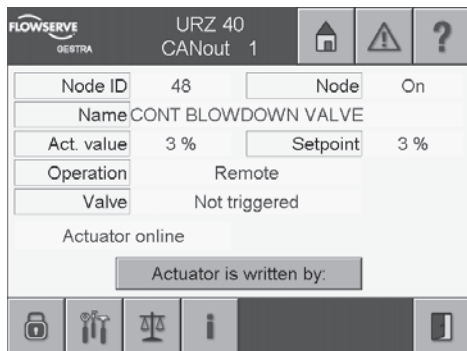
1. Select a green input field in the menu for the CAN outputs.

2. If a CAN output is already parametrised, a relevant status screen such as this is shown.

3. The setup menu is password protected.

Press  and enter your password.

4. To get to the following setup menu, press the button .



Node ID	48	Node	On
Name	CONT BLOWDOWN VALVE		
Act. value	3 %	Setpoint	3 %
Operation	Remote		
Valve	Not triggered		
Actuator online			
Actuator is written by:			



#### Note

Malfunctions in the actuator are shown in red plain text on the screen.

## CAN 1...10 output URZ 40a setup

1. To enter or change the node ID, select the green input field. The default factory setting is 48. When using more than one URZ 40a, a different node ID must be set here and in the electrode.
2. Use the button **Node On/Off** to activate or deactivate the input.
3. To name the CAN input, select the green input field. In the input mask, the on-screen keyboard can be used to enter or change the name.
4. To change the limit values, select the relevant input field. These must be confirmed with the confirm button following successful entry.

URZ 40 Setup	
Node-ID	48
Node Off	Node On
Name CONT BLOWDOWN VALVE	
Timeout /100 ms	50
Block recogn. /100 ms	50
Hysteresis /%	1
Hardware info	Canbus



### Note


After values have been changed, they are shown in the yellow status fields following a short delay.

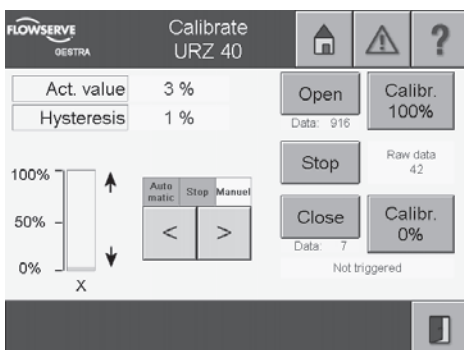
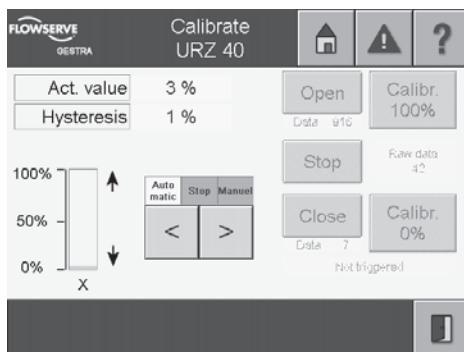
## CAN 1...10 output URZ 40a signal tracing

1. To find out which participants the valve corresponds to, press the button **Actuator is written by**.
2. The valve can obtain a setpoint of the CAN input, controller and burner. This shows the name of the item described and the range limits.

URZ 40 / Valve	
written by:	
Type	Controller 2
Name	CONT BLOWDOWN
Range 0%	0.0
Range 100%	100.0

## CAN 1...10 output Calibrate URZ 40a

1. To calibrate the valve, select the button  from the menu.
2. The current actual value, the hysteresis and the current properties of the valve Open/Close. This is shown with arrows on the bar graphs by a change in colour.
3. The calibration functions are inactive at first as the valve is not yet switched to manual.
4. When you toggle to manual mode this becomes active and the valve can be moved using Open/Stop/Close.
5. Always identify the current raw value of the feedback potentiometer. A status report is also shown in the area below the buttons. This also contains the end position Open or Close.
6. When you have moved the valve in the desired direction and reached the end position, the adjustment can be made and the raw value that has been reached at that point is written below the relevant buttons.




### Note










When you leave the page, the valve is automatically switched back to manual mode.

A plausibility test is also carried out between the raw values Open/Close.

The difference must be  $> 100$  to achieve the greatest possible accuracy. If this difference is not achieved, it is shown in red on the screen.

### Analogue 1...10 input

1. In the Inputs or Outputs menu, press .
2. The green input fields list the names of the current analogue inputs. Active inputs are indicated on the left by a yellow number. On the right side, the currently measured value, the associated unit and the graphical representation are shown. Current alarms are indicated for each individual input by a mark at the left side of the graphical representation.
3. To configure an input, select the green input field. The menu **Analogue 1...10 Input** appears.

FLOWERVE GESTRA		Analogue 1..10 Input				
①	POTI FEEDWATER VALVE	18.28	%			
②	POTI CONT BLOWDOWN VALVE	5.65	%			
③	STEAM FLOWRATE	0.00	m³/h			
④	PRESSURE	0.00	bar			
⑤		0.00				
⑥		0.00				
⑦		0.00				
⑧		0.00				
⑨		0.00				
⑩		0.00				



#### Note




The input sequence corresponds to the order of analogue inputs on the WAGO bus terminal block (max. 5 components, each with 2 of the same types of input from left to right).

### Analogue 1...10 input parameter



1. If an analogue input has already been parametrised, a corresponding status screen (as shown here) is displayed.  
In this example it is a valve position poti.
2. The parameters for the analogue input are shown in the display field.
3. To configure the analogue input

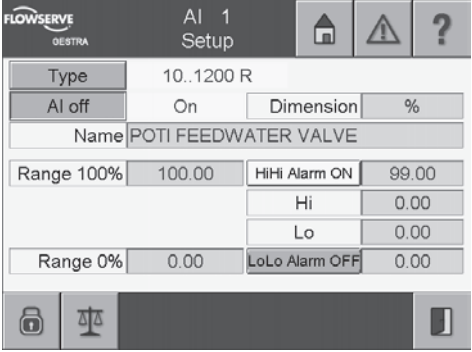
press



FLOWERVE GESTRA		Analogue input 1				
Type	10..1200 R					
AI status	On					
Name	POTI FEEDWATER VALVE					
Meas. Value	18.28%				OK	
Range 100%	100.00	HiHi		99.00		
		Hi		0.00		
		Lo		0.00		
Range 0%	0.00	LoLo		0.00		

## Analogue 1...10 input setup

1. In the menu **Analogue 1...10 Input press**  .
2. The menu **Analogue Input 1...10 Setup** is password protected.  
Press  and enter your password.
3. To select or change the type of sensor, press the Type button. The types of input are shown in a list and can be selected individually. The selected type must tally with the components used in the WAGO bus terminal block.
4. To activate or deactivate the analogue input press the button **AI On/Off**.
5. To select the unit of the measured value, select the green input field.
6. Use the on-screen keyboard to enter or modify the value in the input mask.
7. To name the analogue inputs select the input field.
8. In the input mask, the on-screen keyboard can be used to enter or change the name.
9. To change the range values and limit values, select the relevant input field.  
First set the ranges 0 % and 100 % and then the limit values.
10. In the input mask, the on-screen keyboard can be used to enter or change the value.



FLOWSERVE OESTRA				AI 1 Setup				
Type	10..1200 R							
AI off	On		Dimension	%				
Name POTI FEEDWATER VALVE								
Range 100%	100.00	HiHi Alarm ON	99.00					
		Hi	0.00					
		Lo	0.00					
Range 0%	0.00	LoLo Alarm OFF	0.00					



### Note


The HiHi and LoLo settings can be used for alarms and the Hi and Lo settings can be used for switchpoints of 2-position controllers and in the menu "Logical links". It is also possible to control digital outputs with the limit values entered here.

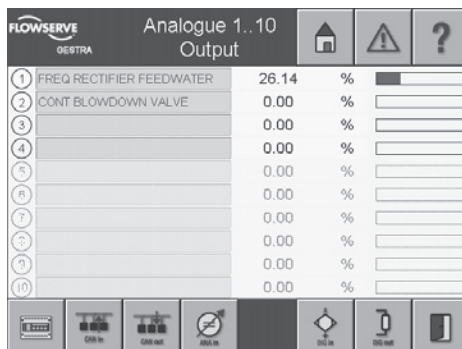
If all values from HiHi to LoLo are set to 0, limit value monitoring is deactivated.

If HiHi/LoLo alarms are switched off, no entry is made in the alarm log.



### Analogue 1...10 output


1. In the Inputs or Outputs menu, press .
2. The green input fields list the names of the current analogue outputs. Active outputs are indicated on the left by a yellow number. At the right side of the current manipulated variable, the associated unit and the graphical representation are shown.
3. To configure the output, select the green input field. The menu **Analogue 1...10 Output** appears.

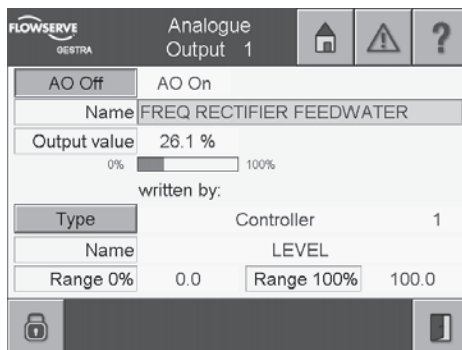


The screenshot shows the 'Analogue 1...10 Output' menu. It features a list of 10 analogue outputs. The first output, 'FREQ RECTIFIER FEEDWATER', is active and shows a value of 26.14%. The other outputs are 'CONT BLOWDOWN VALVE' and eight unnamed outputs, all showing 0.00%. The menu includes navigation icons at the top (home, warning, help) and bottom (AO Off, AO On, AO In, AO Out, AO In, AO Out, AO In, AO Out).

Output	Value	Unit
1 FREQ RECTIFIER FEEDWATER	26.14	%
2 CONT BLOWDOWN VALVE	0.00	%
3	0.00	%
4	0.00	%
5	0.00	%
6	0.00	%
7	0.00	%
8	0.00	%
9	0.00	%
10	0.00	%

### Analogue 1...10 Output parameters


1. The menu **Analogue 1...10 Output** is password protected. Press  and enter your password.
2. To name the analogue output, select the input field **Name**.
3. In the input mask, the on-screen keyboard can be used to enter or change the name.
4. If the analogue output is not specified by a controller you can select a signal to specify the output by pressing the button **Type**. You have the choice of a Can input, an analogue input and a burner signal to control the analogue output.  
Manipulated variable outputs are established in the setup menu of the continuous controller. The controller always has top priority.
5. To activate or deactivate the analogue output, press the button **AO On/Off**.



The screenshot shows the 'Analogue 1...10 Output parameters' menu. It displays the configuration for 'Analogue Output 1'. The 'Name' field is 'FREQ RECTIFIER FEEDWATER'. The 'Output value' is 26.1%. The 'Type' is 'Controller'. The 'Range' is '0.0' to '100.0'. The menu includes navigation icons at the top (home, warning, help) and bottom (lock, AO On/Off, AO In, AO Out).

Parameter	Value
AO Off	AO On
Name	FREQ RECTIFIER FEEDWATER
Output value	26.1 %
Type	Controller
Name	LEVEL
Range 0%	0.0
Range 100%	100.0

## Digital inputs

1. In the menu Inputs or Outputs press .
2. The display field lists the connected signals. Activated inputs are indicated by a yellow signal on the left.
3. The menu **Digital Inputs** is password protected.

Press  and enter your password.

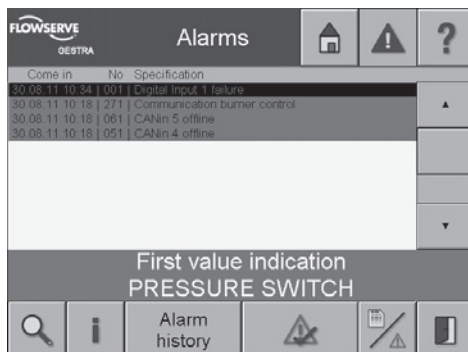
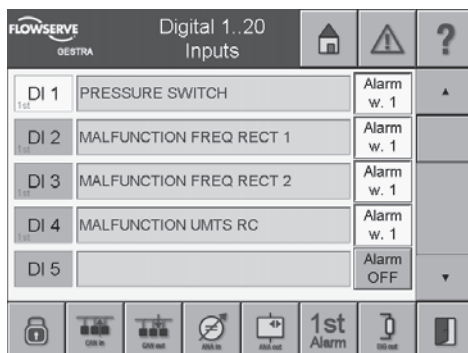
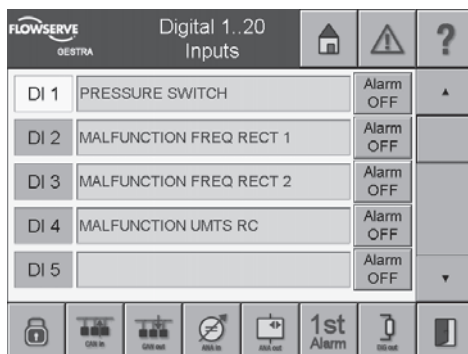
4. To name a signal, select the green input field.
5. Use the on-screen keyboard to enter or change the name in the input mask.
6. Use the three-level Alarm button to select whether the digital input generates an alarm message:

Alarm at signal value 0 (OFF) (yellow)


Alarm at signal value 1 (ON) (yellow)

Alarm OFF (grey)

7. Press the button **1st Alarm** to configure the initial value messages. When the function is configured, the area with the symbol "1st" is shown in the status screen of the digital input. According to the specified alarm parameter the alarm screen opens automatically with the name of the digital input in clear text.

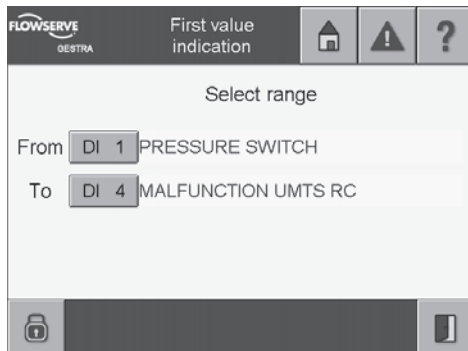


### Digital inputs – first value indication

1. In the menu Digital Inputs, press .
2. The display field shows the digital inputs with the corresponding names.
3. The menu **Digital Inputs** is password protected.

Press  and enter your password.

4. Use the buttons From **DI XX**  
To **DI XX** to specify the range. The  
corresponding name is shown accordingly.





#### Note

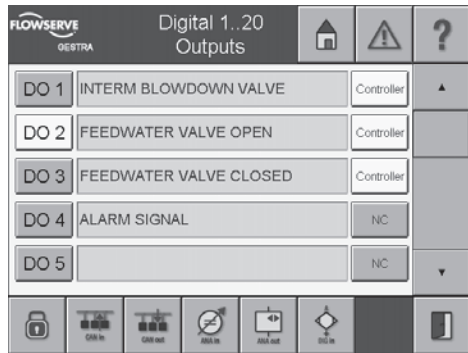
The digital inputs can be used to enable controllers and can also be used in the “logical links”.

They are evaluated in the maintenance logs to monitor run times and/or switching cycles (e.g. pump(s) on/off).

### Digital inputs

1. In the menu Inputs or Outputs press .
2. The display field lists the digital outputs. Activated outputs are shown on the left by a yellow button (**DO 1...20**).
3. The menu **Digital Outputs** is password protected.  
Press  and enter your password.
4. To name a signal, select the green input field.
5. In the input mask, the on-screen keyboard can be used to enter or change the name.
6. To call up information about the activation, press the button **DO 1...20** shown on the left.
7. When you press the button on the right, the digital output can be interconnected with a switch-point (HiHi/Hi/Lo/LoLo) of the CAN input or analogue inputs, limiters or with the result of a logical link if it has not been parametrised in a controller. Controller outputs are dominant.
8. Further information on setting up the limit values can be found in the chapter for CAN and analogue inputs.


You can find information regarding logic parametrisation in the chapter about logical links.



#### Note

Controller outputs that act on a DO have priority. If changes are subsequently desired, the signal in the relevant controller must first be deleted.

## Control equipment

To adjust the control equipment, press the button  in the menu **CAN 1...10 Input**.

1. The display field shows the current name and node ID of the control equipment. Active equipment is indicated by a signal at the left side. If there is a malfunction, the buttons or text boxes are highlighted in red.
2. To show or configure the control equipment, press the respective button.

Current values control equipment					
Device	Name	ID			
<input checked="" type="checkbox"/> NRS 1-40	NC	0			
<input checked="" type="checkbox"/> NRS 1-40.1	SAFETY CIRCUIT - BURNER	1			
<input checked="" type="checkbox"/> NRS 1-40.2	NC	0			
<input checked="" type="checkbox"/> NRS 1-41	SAFETY CIRCUIT - FEEDWATI	6			
<input checked="" type="checkbox"/> LRR 1-40	CONDUCTIVITY CONTROLLER	50			


## NRS 1-40.1

To adjust the control equipment, press the button **NRS 1-40** or **NRS 1-40.1** in the menu **Current values control equipment**.

1. The display area shows the current parameters for the control equipment. Malfunctions are shown in red.

2. The menu **NRS 1-40.1** is password protected.

Press  and enter your password.

3. To show the setup menu press the button .

NRS 1-40.1				
Name SAFETY CIRCUIT - BURNER				
Node	On	Node-ID	1	
Control unit online				
Electrode 1 NRG 16-40		Electrode 2 NRG 16-40		
Electrode 3 TRV 5-40		Electrode 4		

### NRS 1-40/41 setup

1. To change or set the node ID, select the green input field.
2. In the input mask, the on-screen keyboard can be used to overwrite or change the value.
3. The button **Node On/Off** switches the node ID to active or inactive.
4. To name the control equipment, select the input field **Name**.
5. In the input mask, the on-screen keyboard can be used to enter or change the name.

FLOWERVE GESTRA

NRS 1-40.1 Setup

Node ID 1

Node Off Node On

Name SAFETY CIRCUIT - BURNER

Hardware info Canbus



#### Note

The node ID setting in *SPECTORcontrol* must tally with the node ID setting on the equipment.

### NRS 1-40/41 Register limiter 1...4

1. To register or change a limiter, press the relevant button in the status menu of the NRS 1-40.1: Limiter 1...4.
2. When you press the button “Type” a pulldown menu appears and you can select an available limiter from it.
3. The node ID is automatically assigned.
4. The status of the limiter is shown, with alarm messages in red.
5. Use the button “Limiter 1...4” to register additional limiters.
6. The limiters must also be registered on NRS 1-40.1 (DIP switch).

FLOWERVE GESTRA

NRS 1-40.1 Electrode 1

Type NRG 16-40

Node-ID 2

Electrode online


NRG 16-40 TRV 5-40 Electrode 4

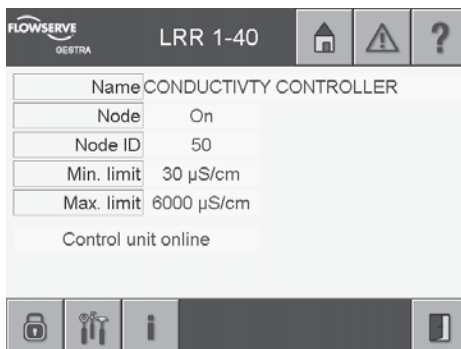
Hardware info Canbus

### LRR 1-40

1. Press the button **LRR 1-40** in the menu **Current values control equipment**.
2. The current values of the equipment are shown in the display field.
3. The menu **LRR 1-40 Setup** is password protected.

Press  and enter your password.

4. To show the setup menu press the button .




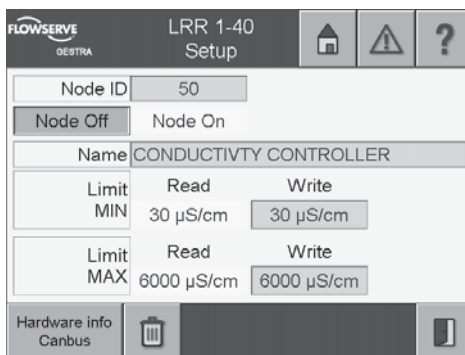
Flowserve Gestra LRR 1-40

Name	CONDUCTIVITY CONTROLLER		
Node	On		
Node ID	50		
Min. limit	30 µS/cm		
Max. limit	6000 µS/cm		
Control unit online			


Navigation icons: lock, wrench, info, home, warning, question mark.

### LRR 1-40 setup

1. Select the menu **LRR 1-40**.
2. To change or set the node ID, select the green input field.
3. In the input mask, the on-screen keyboard can be used to overwrite or change the value.
4. The button **Node On/Off** switches the node ID to active or inactive.
5. To name the LRR 1-40 select the input field **Name**.
6. In the input mask, the on-screen keyboard can be used to enter or change the name.
7. The current limit value is shown in yellow.  
To change the maximum limit value, select the relevant input field.
8. In the input mask, the on-screen keyboard can be used to enter or change the value.
9. When the limit value is confirmed  the value is sent to the equipment. The value is immediately active.



Flowserve Gestra LRR 1-40 Setup

Node ID	50		
Node Off	Node On		
Name	CONDUCTIVITY CONTROLLER		
Limit MIN	Read	Write	
	30 µS/cm	30 µS/cm	
Limit MAX	Read	Write	
	6000 µS/cm	6000 µS/cm	
Hardware info Canbus			

Navigation icons: lock, wrench, info, home, warning, question mark.



#### Note

The node ID setting in *SPECTORcontrol* must tally with the node ID setting on the equipment.

During 72h operation without continuous supervision, the type-tested LRR must be used as a limiter. Its control and blowdown functions are not supported by the *SPECTORcontrol* but are implemented by the control circuit of the *SPECTORcontrol*.



## Controller Menus

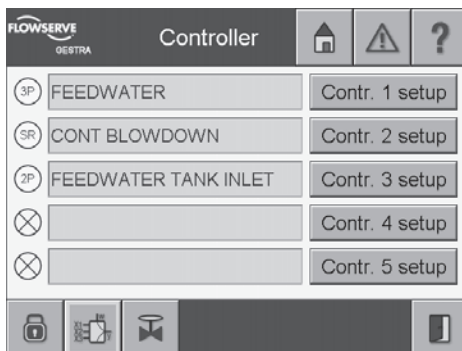
### Controller

To adjust the controller, select the button  from the menu **Overview**.

- The menu **Controller** is password protected.

Press  and enter your password.

- The green input fields list the names of the controllers in question.
- The yellow signal to the left indicates that the controller is activated. SR indicates continuous controller, 2P indicates 2-position controller and 3P indicates 3-position controller.
- To configure a controller, press the button **Controller 1...5 setup**.
- To show the controllers that have already been parametrised select the relevant green field.
- To call up the menu **3-element controller** press .
- To configure the intermittent boiler blowdown press .



### Controller setup

1. Press button **Controller 1...5 setup** in the menu **Controller**.

2. The green input field at the top shows the name of the controller. To rename the controller, select the input field.

3. The current name appears in the input mask. The on-screen keyboard can be used to overwrite or modify this text.

4. The controller can be enabled or disabled by a digital input. Select the green input field at the bottom to go to the relevant selection menu.

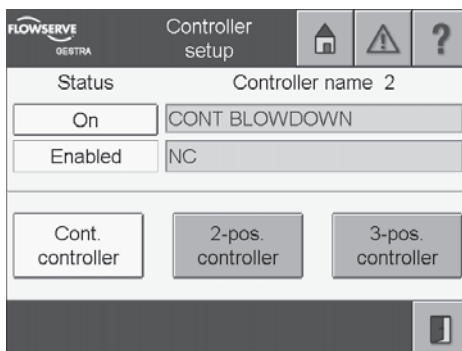
5. Select the signal that shall enable (1) or disable (0) the controller. If no signal has been selected, the acronym NC (not connected) appears. This means that the controller is permanently enabled. The display Enabled/Disabled indicates the status.

6. Use the three controller buttons to activate the controller. An activated controller is visually indicated in the menu **Controller**.

7. Use the button **ON** to deactivate the controller.


8. If no controller type has been selected, the status indicator indicates Off. If a controller has been selected, the button is highlighted in yellow and the status indicator switches to On.

9. To configure the controller, press the button **Continuous controller**, **2-pos. controller** or **3-pos-controller**.





## Continuous controller setup

1. Press the button **Continuous controller** in the menu **Controller setup**.
2. The name of the controller is highlighted in yellow.
3. The green input field **Actual value** shows the actual value indicator. Select the input field to show all established signals.
4. Select the signal that is to provide the actual value. Further information on setting up the devices can be found in the menus CAN input and Analogue input.
5. The green input field **Setpoint** displays the setpoint indicator. The setpoint can be set internally on the device itself or externally, e.g. via a potentiometer.
6. To toggle the setpoint between Internal and External, press the button **Internal setpoint / External setpoint**.
7. To enter the signal for an external setpoint select the green input field. All established sensing elements will be indicated.
8. Select the signal that is to provide the actual value. Further information on setting up the devices can be found in the menus CAN input and Analogue input.
9. The green input field **Position** shows the position indicator. To choose a signal to deliver the position feedback signal, select the green input field. All established signals are shown.
10. Select the signal that is to deliver the signal. Further information on setting up the devices can be found in the menus CAN input and Analogue input.
11. The green input field **Manip. variable** shows the manipulated variable element. To choose a signal for the manipulated variable, select the green input field. All adjusted signals are shown.
12. Select the signal to which the manipulated variable is to be delivered. The settings can be found in the menu for analogue outputs or CAN outputs.
13. The green input field **Offset** displays the current value. To enter or change the value, select the input field.
14. The green input field **Limit min/max** indicates a minimum manipulated variable. To enter or change the value, select the input field.
15. The green input field **Deadz. min/max** indicates an actual value zone of the controller where the controller delivers an unaltered manipulated variable. To enter or change the value, select the input field.
16. Use the button **Softstart off (on)** to go to the page for softstart parametrisation.
17. For controller parametrisation and status display, press .

Offset	Limit min/max	Deadz. min/max
0 %	3 %    100 %	1.00 %    1.00 %

### Continuous controller setup continued



#### Note

The min. and max. limit values specify the manipulated variables of the controller.

The deadzone can be set in the +/- 10 % ranges. If the actual value is in the setpoint's +/- deadzone, the manipulated variable of the controller is stopped. The deadzone reference/standardisation relates to the set measurement range of the actual value.

### Continuous controller softstart

1. Press the button Softstart on/off, to activate/deactivate the softstart.
2. To change the limit value, select the green input field.
3. The current value appears in the input mask.  
The on-screen keyboard can be used to enter or modify this text.
4. To change the gradient, select the green input field.





#### Note

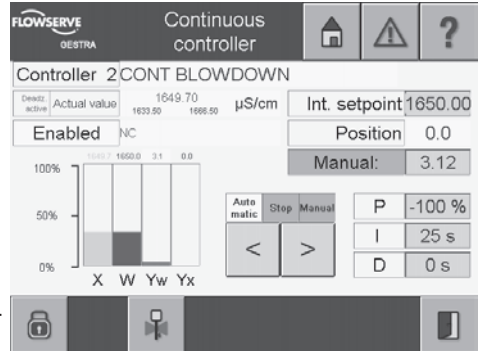
The limit value is the setpoint – the actual value. If the value is below this level, the softstart is automatically activated and drives the setpoint to the set gradient. This happens if:

- the system is restarted
- the system is toggled from automatic -> manual
- the controller has been enabled

The softstart switches off when the value no longer falls below the set limit value. The status of the softstart is provided automatically in the controller parameters at the top right of the screen.

## Continuous controller

1. Press the button  in the menu **Continuous controller setup**.
2. The menu **Continuous controller** is password protected.  
Press  and enter your password.
3. The name of the controller is highlighted in yellow. Below this, the current actual value is shown. The setpoint is next to it and the current controller data is below it.
4. To change the internal setpoint, select the green input field.
5. The current value appears in the input mask. The on-screen keyboard can be used to enter or modify this text.
6. In the input field **Manual** a manipulated variable can be set after toggling to manual mode. To do this, select the green input field.
7. The on-screen keyboard can be used to modify this.
8. Use the arrow buttons to select Automatic mode, Stop or Manual mode. The type of operation that is set is shown in yellow above the arrow buttons.
9. The controller parameters can be entered for the PID controller in the input fields **P** (Proportional), **I** (Integral) and **D** (Differential).
10. The current value appears in the input mask. The on-screen keyboard can be used to modify this.
11. Below the status display Enabled/Disabled and the controller that has been set, the actual value (X), the setpoint (W), the manipulated variable (Yw) and the position feedback signal (Yx) are graphically represented as bar graphs.



### Note

Only the internal setpoint can be set in this menu.

If the controller is connected to an external setpoint indicator and this is faulty, the internal setpoint becomes activated and can be set.

When the switch position is toggled from Automatic mode to Stop, the current manipulated variable (Yw) of the controller is transferred to the Manual field (manipulated variable).


The continuous controller functions as a PI controller.

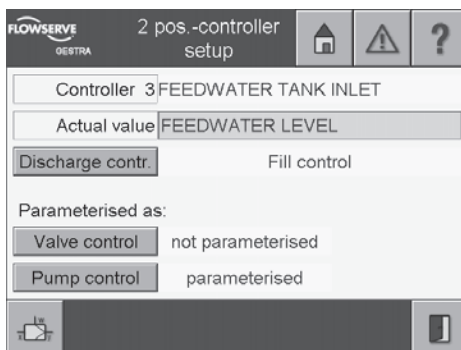
An I part is a mandatory requirement.

If parameters for the deadzone are entered in setup, the status is shown on the left next to the actual value. The bar graph Yw does not change during deadzone activity.

If the softstart is activated, the status is shown by the Int. setpoint.

### 2-position controller setup

1. Press the button **2-pos. controller** in the menu **Controller setup**.
2. The name of the controller is highlighted in yellow.
3. The green input field **Actual value** shows the actual value indicator. Select the input field to show all established signals.
4. Select the signal that is to provide the measured value. Further information on setting up the devices can be found in the menus **CAN input** and **Analogue input**.
5. To toggle between fill and discharge control, press the button **Fill control** or **Discharge control**. The selected control mode is indicated on the right.
6. The bottom field specifies the actuator. This is highlighted in yellow if pump and/or valve control have been set.
7. To set the valve control press the button **Valve control**.
8. To set the pump control press the button **Pump control**.
9. Press the button  to go to the controller status display.



FLOWERVE GE8TRA 2 pos.-controller setup

Controller 3FEEDWATER TANK INLET



Actual value FEEDWATER LEVEL

Discharge contr. Fill control

Parameterised as:

Valve control not parameterised

Pump control parameterised


 

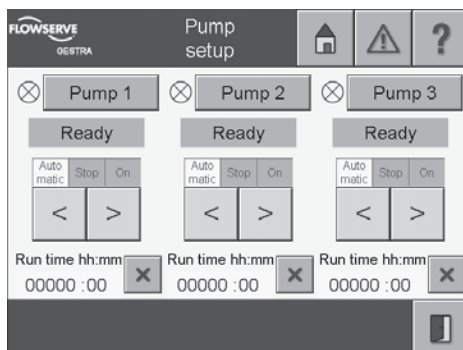


#### Note

For single-pump mode, the valve control signal can be used.

## Pump setup

1. Press **Pump control** in the menu **2-pos. controller setup**.
2. To adjust the pumps, press the button **Pump 1...3**.
3. Use the arrow buttons to select Automatic mode, Stop or Manual mode. The type of operation that is set is shown in yellow above the arrow buttons.
4. Pump operation is indicated by a yellow lamp.
5. The total run time of the pumps is shown in yellow.
6. To delete the operating time press .

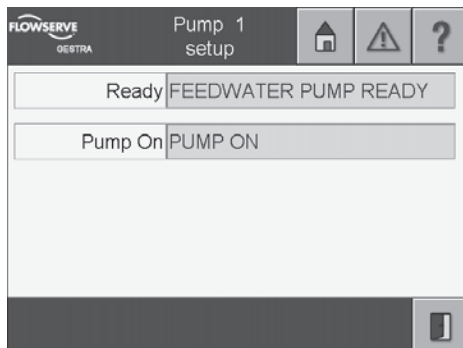


### Note

If there are several pumps available and automatic mode is activated, the pump with the shortest operating time is selected first, provided it is ready for operation.

## Pump 1...3 setup

1. Press the button **Pump 1...3** in the menu **Pump control**.
2. The established digital input signal is indicated in the green input field **Ready**. Select the input field to show all established inputs.
3. Select the input signal that indicates whether the pump is ready for operation.
4. The established digital output signal is shown in the green input field **Pump On**. Select this input field to show all established outputs.
5. Select the output signal that toggles the pump.





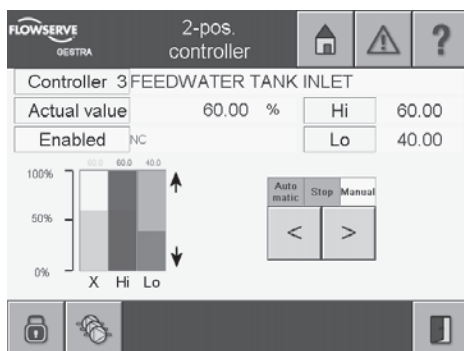
## Valve control

1. Press the button **Valve control** in the menu **2-pos. controller setup**.
2. The relevant adjusted digital output signal is shown in the green input fields **Open** and **Close**. Select the input field to show all established outputs.
3. Select the digital output that is to be activated.



## 2-position controller

1. Press the button  in the menu **2-pos. controller setup**.
2. The menu **2-pos. controller** is password protected.  
Press  and enter your password.
3. The name of the controller is highlighted in yellow. The current actual value is shown below this and the switchpoints Hi and Lo are shown next to that.
4. Below the status indicator **Enabled/Disabled**, the actual value (X), the switchpoint maximum (Hi) and the switchpoint minimum (Lo) are represented as a graph.
5. Use the arrow buttons to select Automatic mode, Stop or Manual mode. The type of operation that is set is shown in yellow above the arrow buttons.
6. In manual mode, a mask with buttons will open. Use the buttons to open or close the valve. The selected button is highlighted and the lamps to the left of the buttons indicate the valve lift.
7. Only if a pump control has been parametrised will the pump status button appear.




### Note

The switchpoints (Hi, Lo) can only be adjusted in the setup of the actual value. Further information on setting up the devices can be found in the menus CAN input and Analogue input.

## Pump status

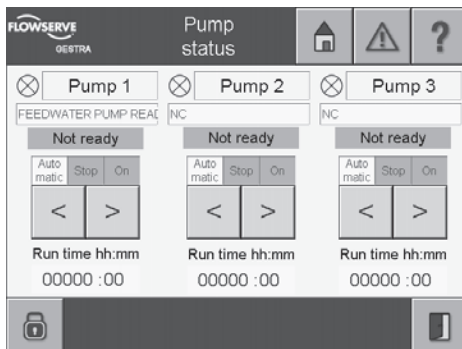
1. Press the button  in the menu **2-pos. controller**.









2. The menu **Pump control** is password protected.

Press  and enter your password.

3. Use the arrow buttons to select Automatic mode, Stop or Manual mode. The type of operation that is set is shown in yellow above the arrow buttons.

4. The total run time of the pumps is shown in yellow.




Pump status				
 Pump 1	 Pump 2	 Pump 3		
FEEDWATER PUMP REAC	NC	NC		
Not ready	Not ready	Not ready		
Auto Stop On	Auto Stop On	Auto Stop On		
< >	< >	< >		
Run time hh:mm	Run time hh:mm	Run time hh:mm		
00000 :00	00000 :00	00000 :00		
				

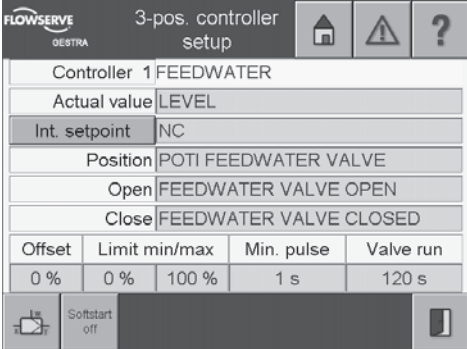


### Note

If there are several pumps available and automatic mode is activated, the pump with the shortest run time is started first, provided it is ready for operation.

## 3-position controller setup

1. Press the button **3-pos. controller** in the menu **Controller setup**.
2. The name of the controller is highlighted in yellow.
3. The green input field **Actual value** shows the actual value indicator. Select the input field to show all established signals.
4. Select the signal that is to provide the actual value. Further information on setting up the devices can be found in the menus **CAN input** and **Analogue input**.
5. The green input field **Setpoint** displays the setpoint indicator. The setpoint can be set internally on the device itself or externally, e.g. via a potentiometer.
6. To toggle the setpoint between Internal and External, press the button **Internal setpoint / External setpoint**.
7. To enter the signal for an external setpoint select the green input field. All established sensing elements will be indicated.
8. Select the signal that is to provide the actual value. Further information on setting up the devices can be found in the menu **Analogue input**.
9. The relevant established signal receiver is shown in the green input field **Open** and **Close**. Select the input field to show all established digital outputs.
10. Select the digital output that is to be activated. Further information on setting up the devices can be found in the digital outputs menu.
11. The green input field **Offset** displays the current value. To enter or change the value, select the input field.
12. The set value appears in the input mask. The on-screen keyboard can be used to overwrite or modify this text.
13. The green input fields **Limit min/max** show the current manipulated variable limits. To enter or change the value, select the input field.
14. The green input fields **Min. pulse** and **Valve run** show the current values. To enter or change the value, select the input field.
15. The **Min. pulse** indicates the minimum controller manipulated variable that must be reached before a control pulse is emitted.
16. Use the button **Softstart off (on)** to go to the page for softstart parametrisation.
17. For controller parametrisation and status display, press .



3-pos. controller setup				
Controller 1 FEEDWATER				
Actual value		LEVEL		
Int. setpoint		NC		
Position		POTI FEEDWATER VALVE		
Open		FEEDWATER VALVE OPEN		
Close		FEEDWATER VALVE CLOSED		
Offset	Limit min/max	Min. pulse	Valve run	
0 %	0 %	100 %	1 s	120 s
Softstart off				



### Note


The min. and max. limit values specify the manipulated variables of the controller.



## 3-position controller

1. Press the button  in the menu **3-pos. controller setup**.

2. The menu **3-pos. controller** is password protected.

Press  and enter your password.

3. The name of the controller is highlighted in yellow. The current actual value is shown below this and the setpoint is shown next to that.

4. To change the internal setpoint, select the green input field.

5. The current value appears in the input mask. The on-screen keyboard can be used to modify this.

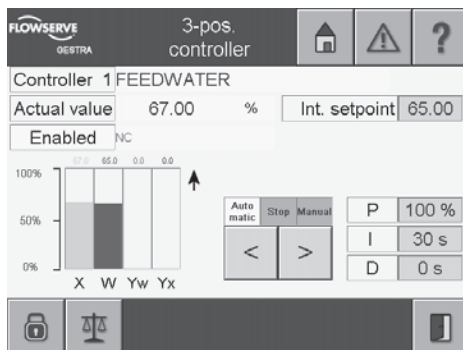
6. Use the arrow buttons to select Automatic mode, Stop or Manual mode. The type of operation that is set is shown in yellow above the arrow buttons.

7. In manual mode, a mask with buttons opens. Use the buttons to open or close the valve continuously. The selected button is highlighted and the lamps to the left of the buttons indicate the valve lift.

8. The controller parameters can be entered for the PID controller in the input fields **P** (Proportional), **I** (Integral) and **D** (Differential).

9. The current value appears in the input mask. The on-screen keyboard can be used to modify this.

10. Below the status display **Enabled/Disabled** and the controller that has been set, the actual value (X), the setpoint (W), the manipulated variable (Yw) and the position feedback signal (Yx) are graphically represented as a bar graph.



### Note

Only the internal setpoint can be set in this menu.

When the switch position is toggled from Automatic mode to Stop, the current manipulated variable (Yw) of the controller is transferred. This only applies when operating as a positioner.

If a position feedback signal is parametrised, the controller functions as a positioner. If there is no position feedback signal parametrised, or if this sensor is faulty, the controller functions as a 3-pos. stepping controller.

The 3-point controller functions as a PI controller.


An I part is a mandatory requirement.

If the softstart is activated, the status is shown by the Int. setpoint.

### 3-element controller

1. Press the button  in the menu **Controller**.

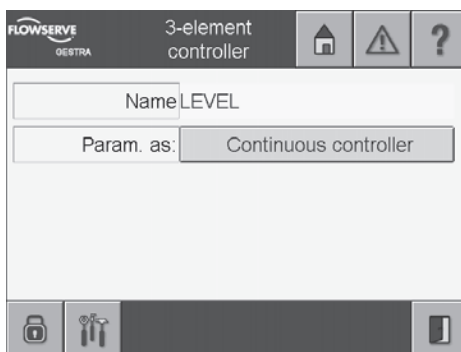
2. The menu **3-element controller** is password protected.

Press  and enter your password.

3. The name of the controller is highlighted in yellow.

4. If a controller has been set, the type of controller is shown. Select the green input field to open the menu **3-element controller**.

5. To configure the controller press .



### 3-element controller setup

1. Press the button  in the menu **3-element controller**.

2. The green input field at the top shows the name of the controller in question. To rename the controller, select the input field.

3. The current name appears in the input mask. The on-screen keyboard can be used to modify this.

4. The controller can be enabled or disabled by a digital input. Select the green input field at the bottom to go to the selection menu.

5. Select the signal that is to enable (1) or disable (0) the controller.

Further information on setting up the devices can be found in the menu **Digital inputs**.

If no signal has been selected, the acronym **NC** (not connected) appears.

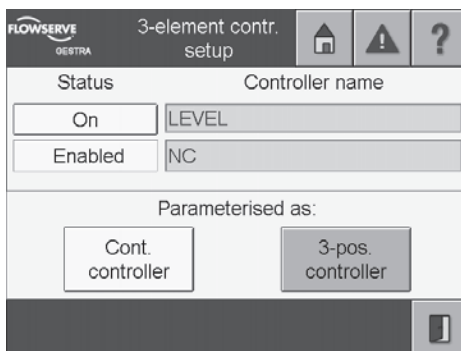
This means that the controller is permanently enabled. The display **Enabled/Disabled** indicates the status.

6. Use the two controller buttons to activate the controller.

7. Use the button **On** to deactivate the controller.

8. If no controller type has been selected, the status indicator indicates **Off**. If a controller is selected, the button is highlighted in yellow and the status indicator indicates **On**.

9. To configure the controller, press the button **Cont. controller** or **3-pos. controller**.



## 3-element continuous controller setup

1. Press the button **Cont. controller** in the menu **3-element contr. setup**.
2. The name of the controller is highlighted in yellow.
3. The green input fields **Qty. of steam**, **Water flowrate** and **Level** show the signals that have been set. Select the input field to show all established signals.
4. Select the signal that is to provide the measured value.
5. The green input field **Rating** shows the value that has been set. To change this, select the input field. The value rates the influence of the difference (steam and water flowrate) on the measured level signal.
6. The current value appears in the input mask. The on-screen keyboard can be used to modify this.
7. To toggle the setpoint between Internal and External, press the button **Internal setpoint / External setpoint**.
8. To enter a signal for an external setpoint, select the green input field. All established sensing elements will be indicated.
9. The green input field **Position** shows the position indicator. To choose a signal to deliver the position feedback signal, select the green input field. All signals that have been set may be selected.
10. The green input field **Manip. variable** shows the manipulated variable element. To choose a signal for the manipulated variable, select the green input field. All signals that have been set may be selected.
11. The green input field **Offset** displays the current value. To change the value, select the input field.
12. The green input fields **Limit min/max** show the current limit values for the manipulated variable. Select the relevant input field to enter or change the value.
13. The green input field **Deadz. min/max** indicates an actual value zone of the controller where the controller delivers an unaltered manipulated variable. To enter or change the value, select the input field.

3-element cont. controller setup	
Name	LEVEL
Qty. of steam	STEAM FLOWRATE
Water flowrate	AMOUNT OF WATER
Rating	1.800
Level	LEVEL
Int. setpoint	NC
Position	POTI FEEDWATER VALVE



### Note

Controlled actual value = Level – (Qty. of steam – water flowrate) x Rating (only when Qty. of steam – Water flowrate > 0).

If the signal for steam quantity or water flowrate is faulty, the controller will only use the Level actual value.

## 3-element 3-position controller setup

1. Press the button **3-pos. controller** in the menu **3-element controller setup**.
2. The name of the controller is highlighted in yellow.
3. The green input fields **Qty. of steam**, **Water flowrate** and **Level** show the signals that have been set. Select the input field to show all established signals.
4. Select the signal that is to provide the measured value.
5. The green input field **Rating** shows the value that has been set. To change this, select the input field. The value rates the influence of the difference (steam and water flowrate) on the measured level signal.
6. The current value appears in the input mask. The on-screen keyboard can be used to modify this.
7. To toggle the setpoint between Internal and External, press the button **Internal setpoint / External setpoint**.
8. To enter a signal for an external setpoint, select the green input field. All established sensing elements will be indicated.
9. The green input field **Position** shows the position indicator. To choose a signal to deliver the position feedback signal, select the green input field. All signals that have been set may be selected.
10. The green input fields **Open** and **Close** show the relevant adjusted signal receiver. Select the input field to show all established signals.
11. The green input field **Offset** displays the current value. To change the value, select the input field.
12. The green input fields **Limit min/max** show the current limit values for the manipulated variable. Select the relevant input field to enter or change the value.
13. The green input fields **Min. pulse** and **Valve run** show the current values. To change the value, select the input field.

3-element 3-pos. controller setup	
Name	LEVEL
Qty. of steam	STEAM FLOWRATE
Water flowrate	AMOUNT OF WATER
Rating	1.800
Level	LEVEL
Int. setpoint	NC
Position	POTI FEEDWATER VALVE



### Note

Controlled actual value = Level – (Qty. of steam – water flowrate) x Rating  
(only when Qty. of steam – Water flowrate > 0).

If the signal for steam quantity or water flowrate is faulty, the controller will only use the Level actual value.

## 3-element continuous / 3-position controller

1. Press the green button **Parametrised as** in the menu **3-element controller**.

2. The menu is password protected.

Press  and enter your password.

3. The values of the steam quantity and the water flowrate are highlighted in yellow. Below that, the current level, the status indicator **Enabled/Disabled** and the established controller are shown. Next to these values the setpoint and the current controller setting are indicated.

4. To change the internal setpoint, select the green input field.

5. The current value appears in the input mask. The on-screen keyboard can be used to modify this.

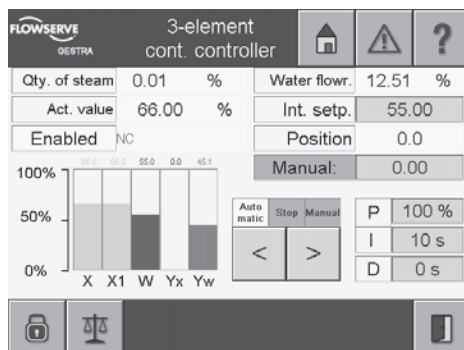
6. Use the arrow buttons to select Automatic mode, Stop, or Manual Mode.

7. If the 3-position controller is in manual mode, a new mask with buttons opens. Use the buttons to open or close the valve. The selected button is highlighted. If the continuous controller is in manual mode, the manual manipulated variable is entered into the green input field **MANUAL**.

8. The controller parameters can be entered for the PID controller in the input fields **P** (Proportional), **I** (Integral) and **D** (Differential).

9. The current value appears in the input mask. The on-screen keyboard can be used to modify this.

10. Below the status display **Enabled/Disabled** and the controller that has been set, the actual value (X), the calculated level (X1), the setpoint (W), the manipulated value (Yw) and the position feedback signal (Yx) are graphically represented as a bar graph.



### Note

Only the internal setpoint can be set in this menu.

When the switch position is toggled from Automatic mode to Stop, the current manipulated variable (Yw) of the controller is transferred. This applies for operation as continuous or 3-pos. positioner.

If a position feedback signal is parametrised, the controller functions as a positioner. If there is no position feedback signal parametrised, or if this sensor is faulty, the controller functions as a 3-pos. stepping controller.


The controllers function as PI controllers.

An I part is a mandatory requirement.

## Intermittent blowdown

1. Press the button  in the menu **Controller**.

2. The menu **Intermittent blowdown** is password protected.

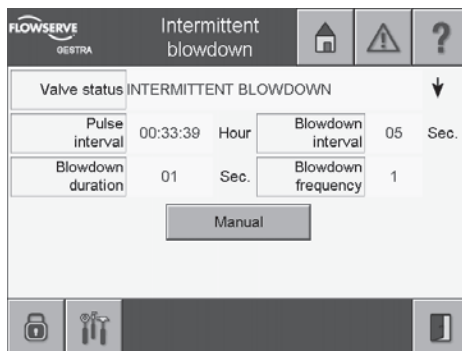
Press  and enter your password.

3. The field **Valve status** shows the name of the digital output. If the output is activated, the background colour changes from yellow to green.

4. The yellow numeric fields show the currently remaining run times. When the pulse interval has elapsed, the intermittent blowdown valve opens for the specified amount of time. The number for the intermittent blowdown pulse and the intermittent blowdown interval are also shown as remaining run time.

5. Select  for parametrisation.

6. Press the button **Manual** to manually start the intermittent blowdown process. The pulse interval time is restarted.



The screenshot shows the 'Intermittent blowdown' menu. At the top, it says 'FLOWERVE GESTRA'. The title 'Intermittent blowdown' is in the center, with a home icon, a warning icon, and a question mark icon to its right. Below the title, there's a 'Valve status' field showing 'INTERMITTENT BLOWDOWN'. To the right of this is a dropdown arrow. Below that, there are two rows of fields. The first row has 'Pulse interval' with a value of '00:33:39' and 'Hour', and 'Blowdown interval' with a value of '05' and 'Sec.'. The second row has 'Blowdown duration' with a value of '01' and 'Sec.', and 'Blowdown frequency' with a value of '1'. Below these fields is a 'Manual' button. At the bottom, there are three icons: a lock icon, a tools icon, and a document icon.

## Blowdown setup

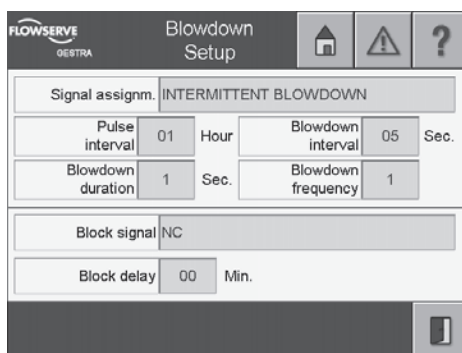
1. Press the button  in the menu **Intermittent blowdown**.

2. The green input field **Signal assignment** shows the name of the signal output to be activated. Select the green input field to show all established signals.

3. Enter the values in the fields **Blowdown duration** (recommended 2-3 s), **Pulse interval**, **Blowdown interval** and **Blowdown frequency**. To do this, select the green input field.


4. The green input field **Block signal** shows the name of the input signal that prevents the intermittent blowdown process. Select the green input field to show all established signals.

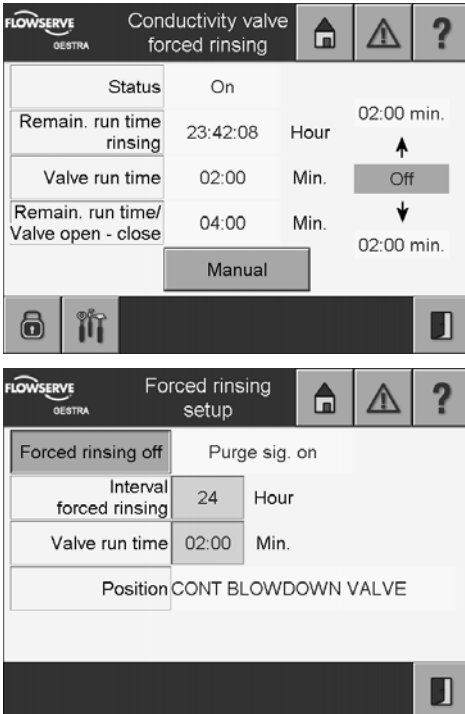
5. The **Block delay** indicates a time after which the intermittent blowdown is re-enabled after the block signal has become inactive.



The screenshot shows the 'Blowdown Setup' menu. At the top, it says 'FLOWERVE GESTRA'. The title 'Blowdown Setup' is in the center, with a home icon, a warning icon, and a question mark icon to its right. Below the title, there's a 'Signal assignm.' field showing 'INTERMITTENT BLOWDOWN'. Below that, there are two rows of fields. The first row has 'Pulse interval' with a value of '01' and 'Hour', and 'Blowdown interval' with a value of '05' and 'Sec.'. The second row has 'Blowdown duration' with a value of '1' and 'Sec.', and 'Blowdown frequency' with a value of '1'. Below these fields, there's a 'Block signal' field showing 'NC'. At the bottom, there's a 'Block delay' field showing '00' and 'Min.'. At the very bottom, there is a document icon.

## Forced rinsing

1. In a menu, such as Continuous controller, press the button .
2. The yellow status fields show the remaining run time and valve run time.
3. When the button **Manual** is pressed, the forced rinsing is started manually. The remaining rinsing run time is restarted.
4. If forced rinsing is activated, the valve run times are to be monitored.
5. Press the button **Setup**, to establish the forced rinsing.
6. Enter the valve run time in the field **Valve run time**. This is calculated from Close to Open. The run time is automatically doubled.
7. The manipulated variable Name is automatically produced from the connected actuator.



**Conductivity valve forced rinsing**

Status	On		
Remain. run time rinsing	23:42:08	Hour	02:00 min.
Valve run time	02:00	Min.	Off
Remain. run time/Valve open - close	04:00	Min.	02:00 min.
<b>Manual</b>			

**Forced rinsing setup**

Forced rinsing off	Purge sig. on		
Interval forced rinsing	24	Hour	
Valve run time	02:00	Min.	
Position	CONT BLOWDOWN VALVE		



### Note

The button **Forced rinsing** only appears for a parametrised conductivity electrode LRG 16-4X for the parameters continuous/2-position/3-position controller.

If forced rinsing is activated, the controller is deactivated and does not intervene in the controller properties.

## Boiler Menus

### Boiler

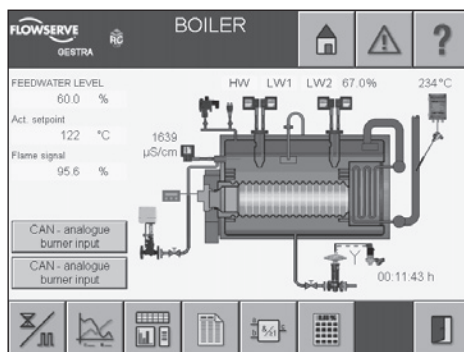
Press the button  in the menu **Overview** to get to the boiler data.

The diagram in the display field corresponds to the schematic representation of the boiler system with the most important valves and sensors and the dynamic representation of the relevant measured values.

It can be adapted to individual customers.

On the left side, 6 visible and/or invisible buttons give you the option to show measured values from the ranges:

**Can input**  
**Analogue input**  
**Burner signal**  
**Steam quantity**  
**Calculations**



The following functions can be reached via the menu bar:



Maintenance log

Monitor the operating hours and switching cycles of selectable actuators



Datalogs

5 trend records, each with 2 selectable measured values



Quantity accumulation

Sum of 5 quantities or flowrates in daily and month logs



Data table

Tabular comparison of 8 selectable I/O signals



Logical links

12 freely configurable AND/OR/SET-RESET links






















Calculations

5 computations of all parametrised measured values and constants using basic calculating methods



## Maintenance

1. Press  in the menu **Boiler**.
2. The green input fields show the names of the signals to be monitored. A yellow lamp on the left side signals On and a grey lamp signals Off. The current run time is highlighted in grey (hh:min) and the current number of switch processes for each signal is shown. Infringements of the limit values are immediately shown by red spots.
3. Select the input field to go to the setup menu.

Maintenance					
Signal		Curr. value			
	FEEDWATER PUMP READY		0 :00		0
	NC		0 :00		0
	NC		0 :00		0
	NC		0 :00		0
	NC		0 :00		0





### Note






The activation times and the frequency of switching are accumulated for the selected digital inputs.

## Maintenance 1..5 setup



1. Select the green input field for the desired signal in the maintenance menu.
2. The menu **Maintenance 1...5 setup** is password protected.


Press  and enter your password.

3. Select the green input field to enter or change the signal assignment. All digital inputs are shown as selectable.
4. To enter or change the limits of the run time or switching frequency, select the input field that you wish to change.
5. To delete the current value, select the button  that follows the value to be deleted.

Maintenance 1					
Signal assignment		FEEDWATER PUMP REA			
		Limits	Current value		
Run time	2000 h	0 :00 h			
Cycle time	3000	0			

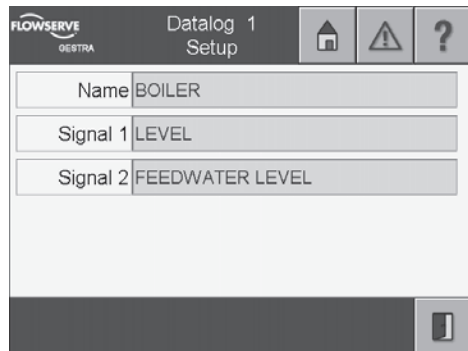
### Datalogs

1. Press  in the menu **Boiler**.
2. The menu **Datalogs** is password protected.  
Press  and enter your password.
3. The green input fields list the names of the datalog in question. The recording intervals and max. length are shown on the left side.
4. To configure a datalog, press the button **Setup 1...5**.
5. Select the relevant input window to show the representation of a datalog.  
The menu **Datalog 1...5** opens.



### Datalog 1...5 setup

1. Press the button **Setup 1...5** in the menu **Datalogs**.
  2. Select the input field **Name** to give the datalog a name.
  3. The current name appears in the input mask.  
The on-screen keyboard can be used to modify this.
  4. To choose a signal, select the relevant input field.  
All measured values from the areas  
**CAN INPUT**  
**CAN output**  
**Analogue input**  
**Steam quantity**  
**Calculation**  
**Burner**
- are shown as selectable, provided that they have been parametrised.



## Datalog 1...5 display



1. Select the green input field of the desired datalog in the menu **Datalogs**.

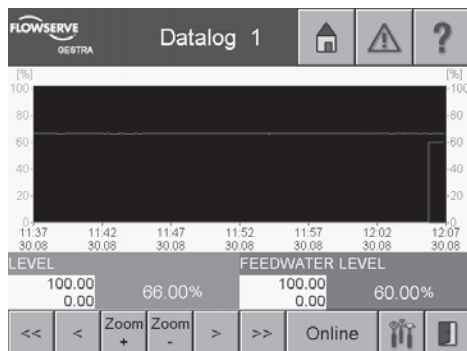
2. The selected diagram appears in the display field with the recorded values from the last 60 minutes.

3. To scroll through the recording, use


  for 15 min increments

  for 60 min increments

  to change the graduation of the time base (stretch/compress).



4. Press the button **Online** to update the data.  
The most recently stored data set is shown.

5. Use  to open the menu **Edit datalog 1...5**.



### Note

Select any area of the display field to display a ruler.

The ruler can be shifted within the time base. The numerical measured values shown correspond to the position of the ruler. Use the button Online to switch back to the current recording status.

## Datalog 1...5 range of representation

1. Press the button **Range of representation** in the menu **Edit datalogs 1...5**.

2. Select the green input fields to select the minimum and maximum values of the range of representation for the relevant measuring signal.

3. The current value appears in the input mask. The on-screen keyboard can be used to modify this.

2. Press the button  to save the current diagram.

Press Save in the information window that opens. Saved datalogs can be read out via an FTP from the CompactFlash™ card and can be evaluated using a spreadsheet program for example.

3. Press the button  to delete the current diagram.

Press Delete in the information window that opens.



Flowserve Gestra Datalog 1 range of repr.

Signal 1 LEVEL

Max 100.00

Min 0.00

Signal 2 FEEDWATER LEVEL

Max 100.00

Min 0.00

Lock Delete Save Document





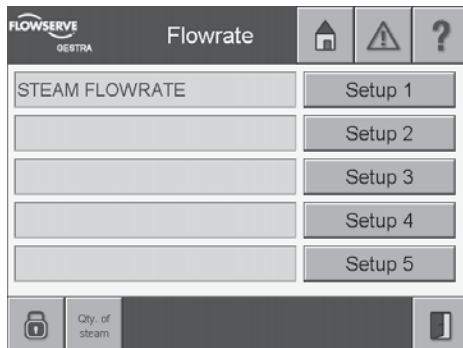
### Note

The min/max value that appears is produced from the original range limit for the measured value to be represented. When the limits are changed, the original values are not changed retrospectively.

By changing the minimum and maximum values, the representation of the measured value in the datalog (trend) can be stretched or compressed.


## Flowrate

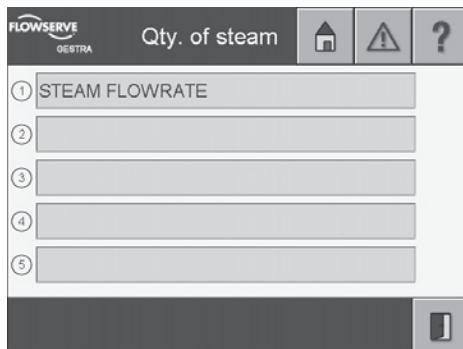
1. Press  in the menu **Boiler**.
2. The menu **Flowrate** is password protected.  
Press  and enter your password.
3. The green input fields list the name of the flowrates in question.
4. To compensate the volume flow of a saturated steam by an amount using temperature/pressure, press the button **Qty. of steam**.
5. To configure a flowrate measurement, press the button **Flowrate 1...5 Setup**.
6. Select the relevant input window to show the parameters of the flowrate measurement.  
The menu **Flowrate 1...5 Parameter** opens.



The screenshot shows the 'Flowrate' menu. At the top, there's a header bar with 'FLOWSERVE' and 'GESTRA' logos, the title 'Flowrate', and three icons: a house, a warning triangle, and a question mark. Below the header, there are five rows, each with a green input field on the left and a 'Setup' button on the right. The first row is labeled 'STEAM FLOWRATE'. The buttons are labeled 'Setup 1' through 'Setup 5'. At the bottom, there's a dark bar with a lock icon, the text 'Qty. of steam', and a small icon on the right.

## Quantity of saturated steam

1. Press  in the menu **Flowrate**.
2. The green input fields take you to the configuration menu for the relevant saturated steam flowrate.



The screenshot shows the 'Qty. of steam' menu. At the top, there's a header bar with 'FLOWSERVE' and 'GESTRA' logos, the title 'Qty. of steam', and three icons: a house, a warning triangle, and a question mark. Below the header, there are five rows, each with a green input field on the left and a small icon on the right. The first row is labeled 'STEAM FLOWRATE'. The input fields are numbered 1 through 5. At the bottom, there's a dark bar with a small icon on the right.

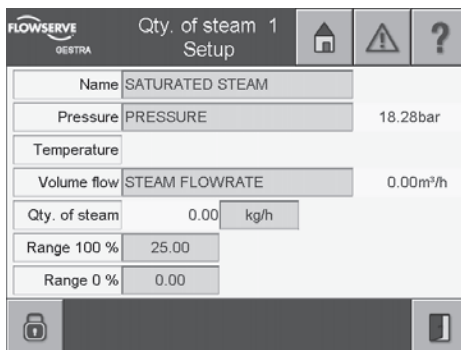
## Quantity of saturated steam 1...5

1. The menu **Qty. of steam Setup** is password protected.

Press  and enter your password.

2. Enter the name for the calculated quantity in the green input field **Name**.
3. Select the green input field **Pressure** or **Temperature** and then the signal that delivers the measured value of the volume flow.
4. For **Volume flow** select the relevant sensor from the list of signals.
5. For **Qty. of steam** adjust the unit for further evaluation of the measured value.  
Press the green input field to toggle the unit between kg/x and t/x.

6. The entries in the green input fields **Range 0 %** and **100 %** are required for representation in the datalog and as bar graphs in the relevant views.



Qty. of steam 1 Setup	
Name	SATURATED STEAM
Pressure	PRESSURE 18.28bar
Temperature	
Volume flow	STEAM FLOWRATE 0.00m³/h
Qty. of steam	0.00 kg/h
Range 100 %	25.00
Range 0 %	0.00



### Note

You can only select pressure *or* temperature for saturated steam compensation.

In the pulldown menu item **Qty. of steam**, you can select the flowrate signal compensated here in the setup of quantity accumulation, the datalog and the calculations and in various menus with measured value representation.

## Flowrate 1...5 setup

1. In the menu **Flowrate** press the button **Flowrate 1...5 Setup**.

2. To name the flowrate measurement, select the input field **Name**.

3. The current name appears in the input mask. The on-screen keyboard can be used to modify this.

4. To enter the flowrate that is to be accumulated, select the green input field **Signal** and select the relevant measured value from the established measured values.

5. To set the store time select the green input fields individually. The store time specifies the time that the accumulated flowrates from the past 24h are allocated to the day on which the accumulation was started.



### Note

Note the unit of the measured values.

The unit must end in:

/h = per hour

/m = per minute

/s = per second

## Flowrate 1...5 parameter

1. In the menu **Flowrate** select the green input field of the desired flowrate measurement.

2. The menu shows the current measured value, the accumulated flowrate of the current day and that of the month and year since the last time they were saved.

3. Press the button **Daily log** to go to the table of saved daily flowrates.

4. Press the button **Month log** to go to the table of saved flowrates for a month.

## Daily log / month log

1. Press the button **Daily log / Month log** in the menu **Flowrate 1...5 Parameter**.
2. The list shown contains the store time and the accumulated flowrates sorted by day or month.

Daily log			
Day	Storage time	STEAM	kg/h
1	01.01.70 00:00	0	▲
2	01.01.70 00:00	0	
3	01.01.70 00:00	0	
4	01.01.70 00:00	0	
5	01.01.70 00:00	0	
6	01.01.70 00:00	0	
7	01.01.70 00:00	0	
8	01.01.70 00:00	0	
9	01.01.70 00:00	0	▼




### Note

Use is made of a circulating memory in order to save the data records. This type of storage makes it possible to keep the data of the last 12 months in the month log and a complete month (31 days) in the daily log. If a month has less than 31 days, the data record saved in the last month with 31 days (marked with time indication) will appear in the space for the day(s) that are not used (e.g. 31st day of the month).














## IO list (table of data)

1. Press the button  in the menu **Boiler**.
2. You have the option here to compile your individual data tables.
3. Select a green input field. You can then choose a signal from all parametrised I/O signals or burner data, or


delete the signal entered .




The measured value is then shown with the following parameters:

- left side: status ON/OFF
- current measured value in numbers
- current measured value as bar graph
- signal status

FLOWERVE GESTRA		Select IO list			
<input checked="" type="checkbox"/>	PRESSURE	18.28 bar		HI	
<input checked="" type="checkbox"/>	LEVEL	65.00 %		OK	
<input checked="" type="checkbox"/>	CONDUCTIVITY	619.70 µS/cm		OK	
<input checked="" type="checkbox"/>	POTI CONT BLOWDOWN VALVE	5.65 %		OK	
<input checked="" type="checkbox"/>		0.00			
<input checked="" type="checkbox"/>		0.00			
<input checked="" type="checkbox"/>		0.00			
<input checked="" type="checkbox"/>		0.00			

## Internal logical links

1. Press the button  in the menu **Boiler**.
2. There are 12 logical links available.
3. Select a green input field to go to the setup menu for the relevant link.

FLOWERVE GESTRA		Int. logical links			
①	CONTROLLER 1 ENABLED	⑦	<input type="text"/>		
②	RUNNING DRY	⑧	<input type="text"/>		
③		⑨	<input type="text"/>		
④		⑩	<input type="text"/>		
⑤		⑪	<input type="text"/>		
⑥		⑫	<input type="text"/>		



### Note

The number on the left next to the name (green input field) shows the status of the link:

- white background = **OFF**
- yellow background = **ON**

## Internal logical links 1...10 setup

1. The menu **Logical links setup** is password protected.

Press  and enter your password.

2. Select the green input field **Name** and enter a name for the link.

3. Select the link symbol to adjust the desired function.

The following options are available:

- AND
- OR
- SET / RESET (flip-flop)

4. Select the time symbol and set the desired time properties.

The following options are available:

- Time off No time (no time input field visible)
- TON Startup delay (time can be set in input field)
- TOF Shutdown delay (time can be set in input field)
- TP Pulse (time can be set in the input field)

5. Select the green input field at the input of the link.

Select the desired signal:

- CAN input (HiHi; Hi; Lo, LoLo) (HiHi; Hi; Lo, LoLo)
- Analogue input (parametrised dig. inputs)
- Digital input (output of a parametrised log. link)
- Internal log. link

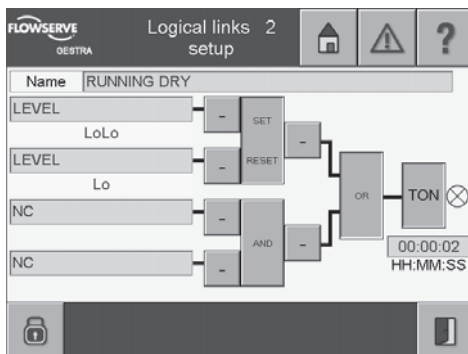
6. Select the buttons on the inputs or on the output of the link symbol to determine whether the signal is to be processed directly or negated.



directly



negated



### Note

The signal status **ON** is shown by red connecting lines.

The combination status **ON** is shown by the yellow signal lamp at the output of the link.

Log. links can be used in enabling controllers and in digital outputs and can also be combined with each other.

## Calculations 1...5

1. Press the button  in the menu **Boiler**.

2. Select a green input field to go to the setup menu of the relevant calculation.

3. The **Calculation** setup is password protected.

Press  and enter your password.


3. Select a green input field and allocate a parameter to the calculation. The following can be assigned to a parameter:

- Constants
- CAN inputs/outputs
- Analogue inputs/outputs
- Steam flowrate

4. These parameters are combined with each other using the following logic modules:

- + (plus)
- – (minus)
- \* (multiply)
- / (divide)

The interim result and final result are shown next to the logic modules.

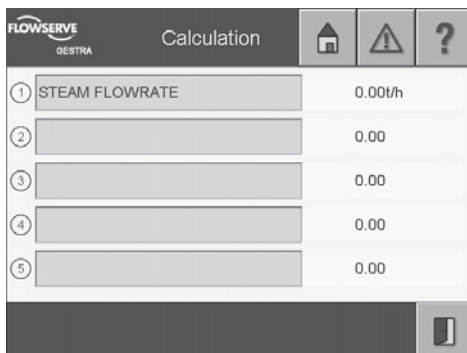
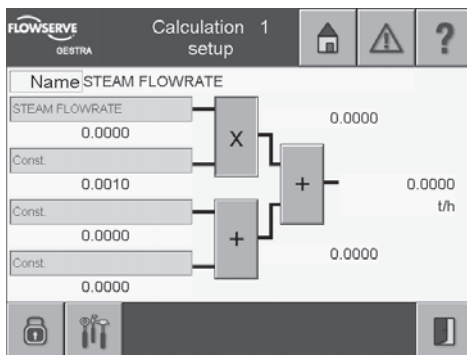
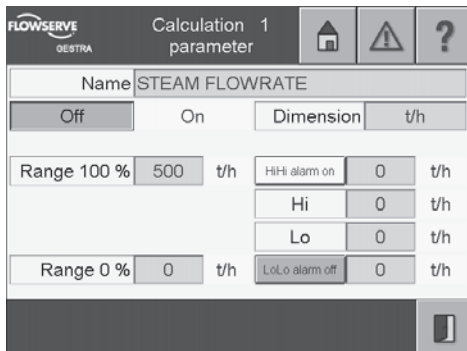
5. Press  and parametrise the **Calculation**.

6. Use the button **On/Off** to activate or deactivate the calculation.

7. Select the green input field to name the calculation. In the input mask, the on-screen keyboard can be used to enter or change the name.

8. To enter the unit of the measured value, select the green input field.

9. To change the range and the limit value, select the relevant input field.



### Note

The number on the left next to the name (green input field) shows the status of the calculation:

- white background = **OFF**
- yellow background = **ON**

No plausibility test is carried out between the individual parameters.

If HiHi/LoLo alarms are switched off, no entry is made in the alarm log.

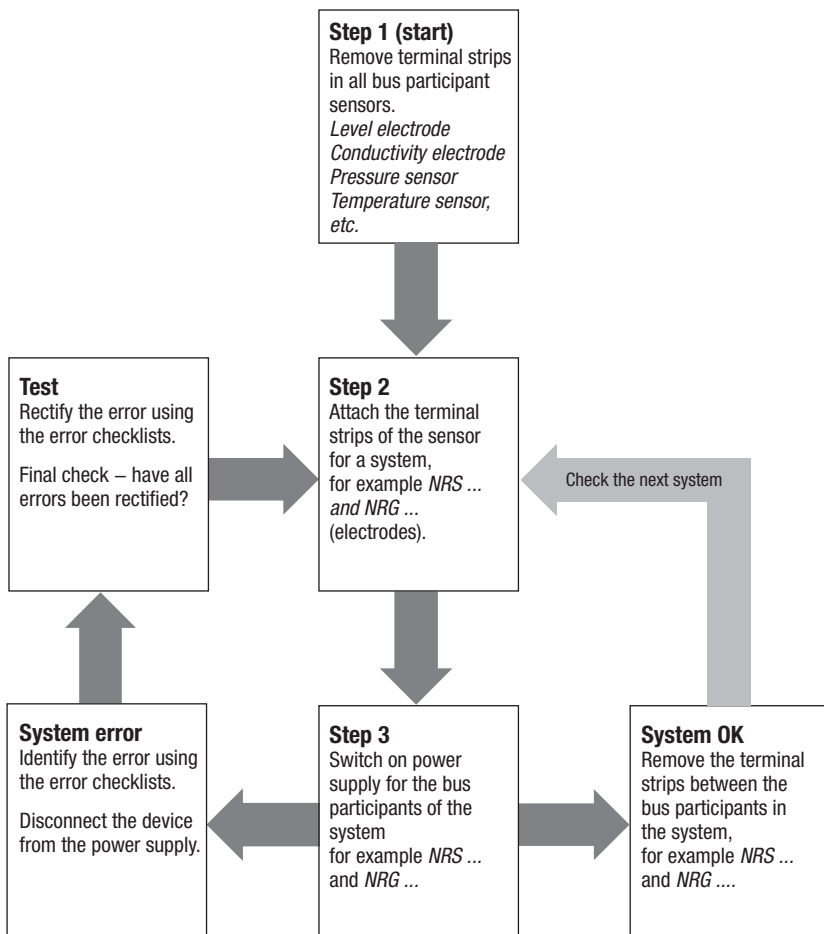
Calculations are used in the **logical links** and **controllers**.

## System Malfunctions

### Systematic malfunction analysis

In system malfunctions in a CAN bus system with several bus participants, the source of an error must be systematically analysed, as individual faulty components or incorrect settings can cause negative interactions between bus participants in CAN bus systems. Error messages may appear for fully functional bus participants as a result of these negative interactions, which makes it difficult to localise the error(s).

**We recommend the following system during malfunction analysis:**



### Causes

System malfunctions occur if CAN bus components have been incorrectly assembled or configured, if the device overheats, if there is interference in the supply network or if the electronic components are faulty.

Other systems malfunctions include:

- Communication errors in the CAN bus system
- Overloading of the 24V power supply unit in the control equipment



### Note

**Prior to systematic malfunction analysis please check the following:**

**Wiring:**

Does the wiring correspond to the wiring diagram?

Is the bus line polarity correct throughout?

Is the bus line for each of the end devices complete with a resistance of 120  $\Omega$ ?

**Node ID:**

Are the node IDs set correctly?

Node IDs must not be doubly assigned.

**Baud rate:**

Does the cable length correspond to the set baud rate?

(If the baud rate is incorrectly set, the URB 2 emits an acoustic signal.)

Is the baud rate the same for all equipment?



### Important

Further information about possible system malfunctions can be found in the user's manual for the connected equipment.

## Glossary

### Continuous boiler blowdown

As the boiler water evaporates, the concentration of non-volatile dissolved solids (TDS) left behind in the boiler increases over time as a function of steam consumption. If the TDS (= total dissolved solids) concentration exceeds the limit defined by the boiler manufacturer, foaming and priming occurs as the density of the boiler water increases, resulting in a carry-over of solids with vapour into steam lines and superheaters. As a result, the operational safety is impaired and the steam boiler and/or pipelines can be damaged. To keep the TDS concentration within admissible limits, a certain portion of boiler water must be removed continuously or periodically (by means of a continuous blowdown valve) and fresh make-up water must be added to the boiler feed to compensate for the water lost through blowdown.

### Intermittent blowdown

During the evaporation process, fine sludge is deposited on heating surfaces and in the lowest part of the steam boiler. The accumulated sludge sediments form a thermally insulating layer and can damage the boiler walls due to excessive heat.

Intermittent blowdown is performed by opening the intermittent blowdown valve quickly.

The resulting suction effect occurs only at the moment when the valve is being opened. The opening time should therefore not exceed 2 seconds. The timed pulse/interval control of the intermittent blowdown valve optimises sludge removal while minimising loss of boiler water.

The interval between the intermittent blowdown pulses can be set between 1 and 120 h (**intermittent blowdown interval**). The **duration of the intermittent blowdown** can be set between 1 and 60 s.

For larger boilers it may be necessary to repeat the intermittent blowdown pulses. The **intermittent blowdown pulses** can be repeated up to 5 times within 5 – 30 seconds (**pulse interval**).

### Sensitivity (conductivity level control)

The level electrode NRG 16-42 only works when used in water with a minimum electrical conductivity. If the electrical conductivity of the boiler water is < 10 µS/cm at 25 °C set the sensitivity to 0.5 µS/cm.

### Operating position of the continuous blowdown valve

It is common practise to use the continuous blowdown valve to remove water from the boiler in order to keep the TDS within certain predefined limits. This means that the valve must be permanently open so that a steady flow of water is ensured (the valve is in the operating position).

The operating position is adjustable between 0 and 25 %. For the corresponding amount of boiler blowdown refer to the capacity charts of the continuous blowdown valve.

### CANopen actuator

The continuous blowdown valve and/or the control valve is equipped with a CANopen actuator. See user's manual EF 1-40 / URZ 40.

### Attenuation (conductivity control)

The presence of steam bubbles can lead to greatly fluctuating conductivity readings. An attenuator will damp the oscillations in the measurements.

### Measuring range (conductivity control)

The measuring range setting establishes the actual value output 4-20 mA of the control equipment LRR 1-40.

### Proportional band $X_p$ (conductivity control)

If the controller is to work as a proportional controller, the proportional band can be set between 1 and 150 %. It refers to the adjusted setpoint w. If  $X_p = 0$  is set, the controller is configured as a 2-position controller.

### Proportional band $X_p$ (capacitance level control)

Switchpoint 2 marks the upper limit and switchpoint 3 marks the lower limit of the proportional band. The difference between switchpoint 2 and switchpoint 3 gives the magnitude of the proportional range  $X_p$ .

### **Switching hysteresis Hyst (conductivity control)**

If  $X_p = 0$  is set, the controller is configured as a 2-position controller, which means that the valve will open if there is a position deviation ( $X > w$ ). The conductivity must then decrease until a new valve that is lower than the setpoint minus the adjusted hysteresis is reached. Once this value is reached the valve will be motored into the operating position.

### **Switching times (conductivity and capacitance level control)**

Individual time delays for energising and de-energising can be set for each of the four output relays.

### **Stand-by mode (conductivity control)**

To avoid loss of water, the continuous blowdown control and the program-controlled intermittent boiler blowdown (if activated) can be deactivated during stand-by operation or when the burner is switched off. An external control command will be triggered and, as a result, the continuous blowdown valve will be CLOSED. During stand-by operation the MIN/MAX limits and the monitoring function remain active. After the equipment switches back to normal operation, the continuous blowdown valve is motored into the OPERATING position. In addition an intermittent blowdown pulse is triggered (provided that automatic intermittent boiler blowdown has been activated and an interval period and pulse duration have been set).

### **Temperature compensation (conductivity control)**

The electrical conductivity of water changes as the temperature falls or rises. To obtain meaningful readings it is therefore necessary that the measurements are based on the reference temperature of 25 °C and that the measured conductivity values are corrected by the temperature coefficient factor  $\alpha$  (Tk).

For automatic temperature compensation the following three settings are available: TK Linear, TK Norm or TK Auto.

#### **TK (Linear)**

To ensure that the readings are based on 25 °C, set the TK value between 0 and 3.0 %/°C (default setting 2.1 %/°C). This setting permits the linear temperature compensation of the measured value over the whole measuring range. This method is usually applied for steam boilers operating at a constant service pressure. After the TK is set and the service pressure is reached, use a calibrated conductivity meter to measure the conductivity of the boiler water and compare the reading with the indicated conductivity value. If the reading differs from the indicated conductivity, change the TK setting until they tally.

#### **TK (Norm)**

Since conductivity is not a linear function of temperature over a larger temperature range, various conditioning agents and different basic conductivities were used in order to ascertain empirical conductivity/temperature curves. These curves are stored as standard curves and can be used for temperature compensation. TK (NORM) is suitable for steam boilers operating with variable pressure, which means that the boiler does not have a fixed working pressure (e.g. low load 10 bar, full load 15 bar).

#### **TK (Auto)**

For this method a characteristic conductivity/temperature curve of the plant (Auto curve) is used for temperature compensation. However, a characteristic Auto curve must be recorded first. For this purpose turn the navigation wheel at TK (AUTO) to Start and then press the navigation wheel in order to start recording the curve. Now increase the steam boiler to the highest operating pressure. During the heating process, temperature and conductivity values are recorded at every 10 °C above 100 °C and the current temperature is shown. After having recorded 25 values or if STOP is selected, the equipment stops recording and saves the Auto curve. The TK (AUTO) process is suitable for steam boilers operating with variable pressure.

When the compensation is switched OFF the absolute conductivity is indicated.



### **Cell constant (conductivity control)**

The cell constant is a geometric quantity characteristic of the conductivity electrode and is taken into account when calculating the conductivity. However, this constant may change during operation, e.g. due to dirt deposits accumulated on the measuring electrode.

If a reference measurement yields a result that differs from the indicated conductivity value, check the temperature compensation first. Only if the temperature coefficient setting is no longer sufficient for a correct compensation should you modify the cell constant. In this case, change the cell constant until the reading and the indicated conductivity match.

### **24 hour rinsing (conductivity control)**

To prevent blocking of the continuous blowdown valve a rinsing pulse is triggered when the mains voltage is switched on. The continuous blowdown valve is actuated and opens for 2 minutes. After this period the valve is motored into the CLOSED position where it remains for 2 minutes. The valve is then motored into the OPERATING position or into the required control position. The process is repeated every 24 hours. During stand-by operation the time interval continues without triggering the rinsing pulse. During the rinsing process the MIN limit is not active.

The 24 hour rinsing pulse can be switched ON or OFF.



**For your notes**



Information about representatives around the world can be found at:

**[www.gestra.de](http://www.gestra.de)**

## **GESTRA AG**

Münchener Straße 77

28215 Bremen

Germany

Telefon +49 421 3503-0

Telefax +49 421 3503-393

E-Mail [info@de.gestra.com](mailto:info@de.gestra.com)

Web [www.gestra.de](http://www.gestra.de)