Service manual

Lambdatronic H 3200 for wood chip boiler

Core module version 50.04 - Build 05.14 | Touch control version 60.01 - Build 01.32

Translation of the original German installation instructions for technicians

Read and follow the instructions and safety information!

Technical changes, typographical errors and omissions reserved!

B1480217_en | Edition 24/05/2017

Froeling GesmbH | A-4710 Grieskirchen, Industriestraße 12 | www.froeling.com
1 General

1.1 About these instructions

1.2 Safety information

2 Electrical connection and wiring

2.1 Core modules and connection options

2.1.1 Board view - core module

2.1.2 Mains connection

2.1.3 Connecting the flue gas sensor

2.1.4 Heating circuit pump 0 / burner relay

2.1.5 Connecting the remote control

2.1.6 Connecting a high efficiency pump to the core module

2.2 Expansion modules

2.2.1 Heating circuit module

2.2.2 Hydraulic module

2.2.3 Wood chip module

2.2.4 Power supply

2.2.5 Analogue module

2.2.6 Digital module

2.2.7 Connecting the bus cable

2.2.8 Connect the patch cable to the bus plug

2.2.9 Setting end jumpers

2.2.10 Setting the module address

2.3 Connection diagrams according to pump types

3 Overview of the basic functions

3.1 Visual display

3.1.1 Status LED

3.1.2 Control icons

3.1.3 Display icons

3.2 Selecting the information displays

3.3 Configuring a holiday program

4 Initial start-up with setting wizard

4.1 Before switching on for the first time

4.1.1 Controller check

4.1.2 Check on the connected units

4.1.3 System Check

4.2 General information about the setting wizard

4.3 Switching on for the first time

4.4 Starting the setting wizard

5 Parameter overview

5.1 Heating

5.1.1 Heating - Status

5.1.2 Heating – Temperatures

5.1.3 Heating - Times

5.1.4 Heating - Service

5.1.5 Heating - Heating up program

5.1.6 Heating - General settings

5.2 Water

5.2.1 Water - Status

5.2.2 Water - Temperatures

5.2.3 Water - Times

5.2.4 Water - Service

5.3 Solar

5.3.1 Solar - Status

5.3.2 Solar - Temperatures

5.3.3 Solar - Service

5.3.4 Solar - Heat meter

5.4 Buffer tank

5.4.1 Buffer tank - Status

5.4.2 Buffer tank - Temperatures

5.4.3 Buffer tank - Times

5.4.4 Buffer tank - Service

5.5 Boiler

5.5.1 Boiler - Status

5.5.2 Boiler - Temperatures

5.5.3 Boiler - Times

5.5.4 Boiler - Service

5.5.5 Boiler - General settings

5.6 Boiler 2

5.6.1 Boiler 2 - Status

5.6.2 Boiler 2 - Temperatures

5.6.3 Boiler 2 - Service

5.7 Fuel

5.7.1 Fuel - Service
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.8 Feed system</td>
<td>60</td>
</tr>
<tr>
<td>5.8.1 Feed system - Screw 1 on LB</td>
<td>60</td>
</tr>
<tr>
<td>5.8.2 Feed system - Screw 2 on LB</td>
<td>61</td>
</tr>
<tr>
<td>5.8.3 Discharge system - Rotary agitator</td>
<td>62</td>
</tr>
<tr>
<td>5.8.4 Feed system - Cyclone 1</td>
<td>63</td>
</tr>
<tr>
<td>5.8.5 Feed system - Cyclone 2</td>
<td>65</td>
</tr>
<tr>
<td>5.9 Network pump</td>
<td>67</td>
</tr>
<tr>
<td>5.9.1 Network pump - Status</td>
<td>67</td>
</tr>
<tr>
<td>5.9.2 Network pump - Temperatures</td>
<td>68</td>
</tr>
<tr>
<td>5.9.3 Network pump - Service</td>
<td>69</td>
</tr>
<tr>
<td>5.10 Cascade</td>
<td>71</td>
</tr>
<tr>
<td>5.10.1 Cascade - Status</td>
<td>71</td>
</tr>
<tr>
<td>5.10.2 Cascade - Backup boiler</td>
<td>71</td>
</tr>
<tr>
<td>5.10.3 Cascade - Temperatures</td>
<td>72</td>
</tr>
<tr>
<td>5.10.4 Cascade - Service</td>
<td>73</td>
</tr>
<tr>
<td>5.11 Difference regulator</td>
<td>74</td>
</tr>
<tr>
<td>5.11.1 Difference regulator - Status</td>
<td>74</td>
</tr>
<tr>
<td>5.11.2 Difference regulator - Temperatures</td>
<td>74</td>
</tr>
<tr>
<td>5.11.3 Difference regulator - Times</td>
<td>75</td>
</tr>
<tr>
<td>5.11.4 Difference regulator - Service</td>
<td>75</td>
</tr>
<tr>
<td>5.12 Circulation pump</td>
<td>76</td>
</tr>
<tr>
<td>5.12.1 Circulation pump - Status</td>
<td>76</td>
</tr>
<tr>
<td>5.12.2 Circulation pump - Temperatures</td>
<td>76</td>
</tr>
<tr>
<td>5.12.3 Circulation pump - Times</td>
<td>77</td>
</tr>
<tr>
<td>5.12.4 Circulation pump - Service</td>
<td>77</td>
</tr>
<tr>
<td>5.13 Manual</td>
<td>78</td>
</tr>
<tr>
<td>5.13.1 Manual - Manual operation</td>
<td>78</td>
</tr>
<tr>
<td>5.13.2 Manual - Digital outputs</td>
<td>79</td>
</tr>
<tr>
<td>5.13.3 Manual - Analogue outputs</td>
<td>80</td>
</tr>
<tr>
<td>5.13.4 Manual - Digital inputs</td>
<td>80</td>
</tr>
<tr>
<td>5.14 System</td>
<td>81</td>
</tr>
<tr>
<td>5.14.1 System - Settings</td>
<td>81</td>
</tr>
<tr>
<td>Setting - Boiler temperature</td>
<td>81</td>
</tr>
<tr>
<td>Setting - Slide-on duct</td>
<td>82</td>
</tr>
<tr>
<td>Setting - Flue gas</td>
<td>83</td>
</tr>
<tr>
<td>Setting - Ignition</td>
<td>90</td>
</tr>
<tr>
<td>Setting - Air settings</td>
<td>91</td>
</tr>
<tr>
<td>Setting - Fuel slide-in</td>
<td>93</td>
</tr>
<tr>
<td>Setting - Vibration / WOS / Cleaning</td>
<td>96</td>
</tr>
<tr>
<td>Setting - WOS / Cleaning</td>
<td>97</td>
</tr>
<tr>
<td>Setting - Combustion chamber</td>
<td>98</td>
</tr>
<tr>
<td>Setting - Lambda values</td>
<td>100</td>
</tr>
<tr>
<td>Setting - Lambda values - LSM11 Lambda probe</td>
<td>101</td>
</tr>
<tr>
<td>Setting - Lambda values - Broadband probe</td>
<td>101</td>
</tr>
<tr>
<td>Setting - General settings</td>
<td>102</td>
</tr>
<tr>
<td>5.14.2 System - Current values</td>
<td>104</td>
</tr>
<tr>
<td>Service hours</td>
<td>104</td>
</tr>
<tr>
<td>5.14.3 System - Sensors and pumps</td>
<td>105</td>
</tr>
<tr>
<td>5.14.4 System - Display operating rights</td>
<td>106</td>
</tr>
<tr>
<td>Froling Connect</td>
<td>107</td>
</tr>
<tr>
<td>5.14.5 System - Display allocation</td>
<td>108</td>
</tr>
<tr>
<td>5.14.6 System - System selection</td>
<td>109</td>
</tr>
<tr>
<td>5.15 Diagnostics</td>
<td>110</td>
</tr>
<tr>
<td>5.15.1 Diagnostics - Error display</td>
<td>110</td>
</tr>
<tr>
<td>5.15.2 Diagnostics - Error history</td>
<td>110</td>
</tr>
<tr>
<td>5.15.3 Diagnostics - Clear error history</td>
<td>110</td>
</tr>
<tr>
<td>5.16 Display settings</td>
<td>111</td>
</tr>
<tr>
<td>5.16.1 Display settings - General</td>
<td>111</td>
</tr>
<tr>
<td>Network settings</td>
<td>111</td>
</tr>
<tr>
<td>5.16.2 Display settings - Basic display</td>
<td>112</td>
</tr>
<tr>
<td>5.16.3 Display settings - Date / Time</td>
<td>112</td>
</tr>
<tr>
<td>5.16.4 Display settings - Software update / Service</td>
<td>112</td>
</tr>
<tr>
<td>6 Troubleshooting</td>
<td>113</td>
</tr>
<tr>
<td>6.1 Procedure for fault messages</td>
<td>113</td>
</tr>
<tr>
<td>7 FAQ</td>
<td>115</td>
</tr>
<tr>
<td>7.1 Calibrate the broadband probe</td>
<td>115</td>
</tr>
<tr>
<td>7.2 PWM / 0 - 10V settings</td>
<td>116</td>
</tr>
<tr>
<td>7.3 Software Update Lambdatronic 3200</td>
<td>117</td>
</tr>
<tr>
<td>7.3.1 Carrying out a software update on the boiler controller</td>
<td>118</td>
</tr>
<tr>
<td>7.3.2 Carrying out a software update on the touch control</td>
<td>120</td>
</tr>
<tr>
<td>7.3.3 Finishing a software update</td>
<td>121</td>
</tr>
</tbody>
</table>
1 General

1.1 About these instructions

Please read and follow the operating instructions, in particular the safety information contained therein. Keep them available next to the boiler.

These operating instructions include important information about operation, electrical connection and troubleshooting. The parameters shown depend on the set boiler type and the system configuration!

The constant further development of our products means that there may be minor differences from the pictures and content. If you discover any errors, please let us know: doku@froeling.com.

1.2 Safety information

![DANGER]

When working on electrical components:
Risk of electrocution!

*When work is carried out on electrical components:*
- Only have work carried out by a qualified electrician
- Observe the applicable standards and regulations
  - Work must not be carried out on electrical components by unauthorised people

![WARNING]

When touching hot surfaces:
Severe burns are possible on hot surfaces and the flue gas pipe!

*When work is carried out on the boiler:*
- Shut down the boiler in a controlled way (operating status "Boiler off") and allow it to cool down
- Protective gloves must generally be worn for work on the boiler, and it should only be operated using the handles provided
- Insulate the flue pipes or simply avoid touching them during operation.

The information on safety, standards and guidelines in assembly and operating instructions for the boiler should also be observed.
2 Electrical connection and wiring

2.1 Core modules and connection options

2.1.1 Board view - core module
## Connection instructions

<table>
<thead>
<tr>
<th>Port</th>
<th>Cable dimensions / Specifications / Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus (1)</td>
<td>Port with cable – LIYCY paired 2x2x0.5; Connecting the bus cable</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Warning! CAN L and CAN H must not be connected to +Ubus!" /></td>
</tr>
<tr>
<td>Bus (2)</td>
<td>Patch cable CAT 5 RJ45 SFTP 1:1 configuration; wood chip module connection</td>
</tr>
<tr>
<td>Bus (3)</td>
<td>Patch cable CAT 5 RJ45 SFTP 1:1 configuration, boiler display port</td>
</tr>
<tr>
<td>COM 2 (4)</td>
<td>Null modem cable 9-pin SUB-D; <img src="image" alt="Port can be used as a MODBUS interface" /></td>
</tr>
<tr>
<td>COM 1 (5)</td>
<td>Null modem cable 9-pin SUB-D; <img src="image" alt="Service interface for installing new boiler software or port for the visualisation software" /></td>
</tr>
<tr>
<td>Broadband probe (6)</td>
<td><img src="image" alt="Connection cable" /> <strong>5 x 0.75 mm²</strong>; Connection of a BOSCH or NTK broadband Lambda probe</td>
</tr>
<tr>
<td>Primary air (7)</td>
<td><img src="image" alt="Connection cable" /> <strong>5 x 0.75 mm²</strong>; <img src="image" alt="Primary air flap for T4 90-150" /></td>
</tr>
<tr>
<td>Air flap (8)</td>
<td><img src="image" alt="Connection cable" /> <strong>5 x 0.75mm²</strong>; <img src="image" alt="Connection of secondary air when using the TI wood chip boiler" /></td>
</tr>
<tr>
<td>Latch (9)</td>
<td><img src="image" alt="Connection cable" /> <strong>2 x 0.75 mm²</strong></td>
</tr>
<tr>
<td>High-limit thermostat - STL (10)</td>
<td><img src="image" alt="Connection cable" /> <strong>2 x 0.75mm²</strong>; <img src="image" alt="Warning! Do not connect the emergency off/emergency stop switch to the power supply cable of the boiler. The switch must be a N/C switch and it must be linked to the 24V safety chain of the STL at this terminal." /></td>
</tr>
<tr>
<td>EMERGENCY STOP (11)</td>
<td><img src="image" alt="Connection cable" /> <strong>2 x 0.75mm²</strong>; <img src="image" alt="Warning! Do not connect the emergency off/emergency stop switch to the power supply cable of the boiler. The switch must be a N/C switch and it must be linked to the 24V safety chain of the STL at this terminal." /></td>
</tr>
<tr>
<td>Flowmeter FLM (12)</td>
<td><img src="image" alt="Connection cable" /> <strong>2 x 0.75mm²</strong></td>
</tr>
<tr>
<td>Lambda probe (13)</td>
<td><img src="image" alt="Connection cable" /> <strong>2 x 0.75mm²</strong>; <img src="image" alt="LSM11 Lambda probe connection" /></td>
</tr>
<tr>
<td>Boiler release (14)</td>
<td><img src="image" alt="Connection cable" /> <strong>2 x 0.75mm²</strong>; <img src="image" alt="Warning! The connection must be a floating connection." /></td>
</tr>
<tr>
<td>Flue gas temperature sensor (15)</td>
<td><img src="image" alt="Connection cable" /> <strong>3 x 0.75 mm²</strong></td>
</tr>
<tr>
<td>Ash box contact switch (16)</td>
<td><img src="image" alt="Connection cable" /> <strong>2 x 0.75mm²</strong>; <img src="image" alt="Connection of the door switch when using the TX and TI wood chip boiler." /></td>
</tr>
<tr>
<td>Sensor 2/1 (17/18)</td>
<td><img src="image" alt="Connection cable" /> <strong>2 x 0.75mm²</strong></td>
</tr>
<tr>
<td>Outside temperature sensor (19)</td>
<td><img src="image" alt="Connection cable" /> <strong>2 x 0.75mm²</strong>, shielded from 25m cable length</td>
</tr>
<tr>
<td>Room temperature sensor 2/1 (20/21)</td>
<td><img src="image" alt="Connection cable" /> <strong>2 x 0.75mm²</strong></td>
</tr>
<tr>
<td>Flow temperature sensor 2/1 (22/23)</td>
<td><img src="image" alt="Connection cable" /> <strong>2 x 0.75mm²</strong></td>
</tr>
<tr>
<td>Return sensor RTS (24)</td>
<td><img src="image" alt="Connection cable" /> <strong>2 x 0.75mm²</strong></td>
</tr>
<tr>
<td>Boiler sensor BS (25)</td>
<td><img src="image" alt="Connection cable" /> <strong>3 x 1.5mm²</strong>, power supply</td>
</tr>
<tr>
<td>PWM / 0-10V Pump 1 (26)</td>
<td><img src="image" alt="Connection cable" /> <strong>3 x 0.75mm²</strong>, analysis of current speed</td>
</tr>
<tr>
<td>Induced draught (27)</td>
<td><img src="image" alt="Connection cable" /> <strong>3 x 1.5 mm²</strong>, max. 1.5A / 280W / 230V</td>
</tr>
<tr>
<td>Pump 1 on core module (28)</td>
<td><img src="image" alt="Connection cable" /> <strong>3 x 1.5 mm²</strong>, max. 1.5A / 280W / 230V</td>
</tr>
</tbody>
</table>
### Electrical connection and wiring

#### Core modules and connection options

<table>
<thead>
<tr>
<th>Port</th>
<th>Cable dimensions / Specifications / Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains (29)</td>
<td>Connection cable$^1$ 3 x 1.5mm$^2$</td>
</tr>
<tr>
<td>Mixing valve 2/1 (30/31)</td>
<td>Connection cable$^1$ 4 x 0.75mm$^2$, max. 0.15A / 230V</td>
</tr>
<tr>
<td>Heating circuit pump 2/1 (32/33)</td>
<td>Connection cable$^1$ 3 x 1.5 mm$^2$, max. 2.5A / 500W</td>
</tr>
<tr>
<td>Heating circuit pump HCP 0 / burner relay (34)</td>
<td>Connection cable$^1$ 3 x 1.5 mm$^2$, max. 3A / 600VA</td>
</tr>
<tr>
<td>(35)</td>
<td>Connection cable$^1$ 2 x 0.75mm$^2$,</td>
</tr>
</tbody>
</table>

1. H05VV-F as per DIN VDE 0881-5

#### 2.1.2 Mains connection

Connect the power supply at the "Mains connection" plug

- Flexible sheathed cable must be used for the wiring; this must be of the correct size to comply with applicable regional standards and regulations.

#### 2.1.3 Connecting the flue gas sensor

![Flue gas sensor diagram]

- Green-yellow
- Red +
- Blue -

Core module
2.1.4 Heating circuit pump 0 / burner relay

The connection "Heating circuit pump 0" can be used for heating circuit pump 0 or as burner relays depending on the system setting.

Connecting a HCP 0 up to max. 2 Ampere:

Connecting a HCP 0 up to max. 5 Ampere:

Connection as burner relays:

To oil boiler control: floating contact for burner release
2.1.5 Connecting the remote control

A room temperature sensor is included in the remote control, which sends the current room temperature to the control.

affecting room:

Switch settings:

<table>
<thead>
<tr>
<th>Switch setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>switched-off</td>
<td>Heating circuit deactivated, only frost protection!</td>
</tr>
<tr>
<td>automatic mode</td>
<td>Heating phases according to setback program</td>
</tr>
<tr>
<td>setback mode</td>
<td>Ignores the heating phases</td>
</tr>
<tr>
<td>override circuit</td>
<td>Ignores the setback</td>
</tr>
<tr>
<td>Handwheel…</td>
<td>Allows you to adjust the temperature by +/- 3°C</td>
</tr>
</tbody>
</table>

IMPORTANT! See assembly instructions/functional description for room temperature sensor FRA
2.1.6 Connecting a high efficiency pump to the core module

Wire the high efficiency pump as shown in the connection diagram below:

- Connect the power supply for the high efficiency pump to output "Pump 1" of the core module
- Connect the PWM cable of the high efficiency pump to the corresponding port "PWM / 0-10V"

➤ Make sure that the cables are configured correctly (polarity) in accordance with the connection diagram of the pump!

**Important!** When using a Froling pump assembly:

➤ See "Connection diagrams according to pump types" [page 23]
2.2 Expansion modules

2.2.1 Heating circuit module

Two heating circuits can be controlled as standard with the core module. To extend the heating circuit control, the heating circuit module boards must be expanded. Eight heating circuit modules (addresses 0 to 7) can be added, and the module address must be set correctly.

⇨ See "Setting the module address" [page 22]
2.2.2 Hydraulic module

The hydraulic module makes the connections of sensors and pumps available for the hydraulic components of the system (storage tank, DHW tank etc.).

A hydraulic module is included in the delivery as standard (address 0). A further seven modules (addresses 1 to 7) can be retrofitted.

You must ensure that the module address is given correctly.

⇨ See "Setting the module address" [page 22]
**Connecting an isolating valve**

If an isolating valve is connected to a speed-controlled pump outlet, an RC element must be used. Furthermore, the minimum speed for the pump outlet in use must be set to 100% in the boiler control system.

**Connection example:**

![Diagram showing connection example](image_url)

The outer cable L(bn) should be connected to the outer cable of the respective mains supply of the module or to the core module, HCP0/burner relay output at pin “LV”.

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*Service manual Lambdatronic H 3200 for wood chip boiler | B1480217_en*
**Connecting a high efficiency pump to the hydraulic module**

Wire the high efficiency pump as shown in the connection diagram below:

- Connect the power supply for the high efficiency pump to output "Pump 1" or "Pump 2" of the hydraulic module
- Connect the PWM cables of the high efficiency pump to the corresponding port "AO-P1" or "AO-P2"
  - Make sure that the cables are configured correctly (polarity) in accordance with the connection diagram of the pump!
2.2.3 Wood chip module

The wood chip module is included in standard delivery and has the connections of the hardware components for the wood chip boiler:

### Connection instructions

<table>
<thead>
<tr>
<th>Port</th>
<th>Cable dimensions / Specifications / Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus (1)</td>
<td>CAT 5 patch cable grey RJ45 SFTP 1:1 configuration</td>
</tr>
<tr>
<td>Return sensor (2)</td>
<td>2 x 0.75 mm², shielded</td>
</tr>
<tr>
<td>Combustion chamber sensor (3)</td>
<td>Connection cable of the respective unit</td>
</tr>
<tr>
<td>Underpressure sensor cartridge (4)</td>
<td></td>
</tr>
<tr>
<td>24V power supply (5/6)</td>
<td>Connection cable ¹) 2 x 0.75 mm²</td>
</tr>
</tbody>
</table>
| Fault message (7) | Connection cable ¹) 3 x 1.5 mm²  
Floating changeover contact, max. 2A / 24V, 1A / 230V |
| Combustion air fan (8) | Connection cable ¹) 3 x 1.5 mm² (depending on boiler type) |
| Return mixer (9) | Connection cable ¹) 4 x 1.5 mm², max. 0.15A / 230V |
| Ash screw (10) | Connection cable ¹) 3 x 1.5 mm² |
| Ash screw (11) | Connection cable ¹) 3 x 1.5 mm²  
Connection of the drive unit of the ash discharge into a standard dustbin |
| Vibration motor (12) | Connection of the solenoid when using a condensing boiler heat exchanger in conjunction with the T4 24-50 wood chip boiler |
| WOS drive (13) | Connection cable of the respective unit |
| Electric ignition (14) | |
| Mains connection (15) | Connection cable ¹) 5 x 2.5 mm², 400VAC |
| Feed screw (16) | Connection cable ¹) 4 x 1.5 mm², max. 0.75kW / 400V |
| Stoker screw (17) | Connection cable ¹) 4 x 1.5 mm², max. 0.55kW / 400V |
| Gravity shaft level sensor (18) | Connection cable ¹) 3 x 0.75 mm², N/O switch contact 24V |
### Electrical connection and wiring

<table>
<thead>
<tr>
<th>Port</th>
<th>Cable dimensions / Specifications / Information</th>
</tr>
</thead>
</table>
| Ash screw monitoring (19)           | Connection cable 1) 3 x 0.75 mm², inductive sensor 24V  
                      | □ Monitoring of the tipping grate when using the TX wood chip boiler                                               |
| Lock (20)                           | Connection cable 1) 2 x 0.75 mm², 24V looping through                                                             |
| Overpressure monitor (21)           | Connection cable 1) 2 x 0.75 mm² (depending on boiler type)                                                       |
| Free input (22)                     | Connection cable 1) 2 x 0.75 mm²  
                      | □ Connection of the contact switch to the monitoring system of the heat exchanger system (T4 130/150)             |
| Gravity shaft cover (23)            | Connection cable 1) 2 x 0.75 mm², N/O switch contact                                                              |
| Grate tip drive (24)                | Connection of the grate tip drive of the TX wood chip boiler                                                      |
| Burn back flap (25)                 | Connection cable 1) 6 x 0.75 mm²  
                      | □ Connection of the grate tip drive of the T4 wood chip boiler                                                   |

1. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0881-5

### Fuses:

<table>
<thead>
<tr>
<th>Fuses</th>
<th>Rating AT</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1, F3, F6</td>
<td>2.5</td>
<td>Stoker screw</td>
</tr>
<tr>
<td>F4, F5, F7</td>
<td>2.5</td>
<td>Feed screw</td>
</tr>
<tr>
<td>F2</td>
<td>6.3</td>
<td>230V drives</td>
</tr>
</tbody>
</table>

### Connecting the tipping grate motor (TX wood chip boiler only)

<table>
<thead>
<tr>
<th>Connection cable</th>
<th>Wood chip module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black (plug 1)</td>
<td>Grate tip drive (OUT)</td>
</tr>
<tr>
<td>Blue (plug 1)</td>
<td>Grate tip drive (GND)</td>
</tr>
<tr>
<td>Brown (plug 2)</td>
<td>+24V supply (+24V)</td>
</tr>
</tbody>
</table>

---

[Diagram of electrical connections and wiring]
### 2.2.4 Power supply

The power supply is used to supply all parts of the system that consume energy with 24 VDC:

#### Connection instructions

<table>
<thead>
<tr>
<th>Port</th>
<th>Cable dimensions / Specifications / Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mains connection</td>
<td>Connection cable 1) 3 x 1.5 mm²</td>
</tr>
<tr>
<td>24V power supply</td>
<td>Connection cable 1) 2 x 1.0 mm², max. 2A</td>
</tr>
</tbody>
</table>

1) YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0881-5

#### Fuses

| F1   | 2 AT | 24 VDC |

---

Service manual Lambdatronic H 3200 for wood chip boiler | B1480217_en
2.2.5 Analogue module

Connection instructions

<table>
<thead>
<tr>
<th>Port</th>
<th>Cable dimensions / Specifications / Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermocouple (1)</td>
<td>Connect sensor under moving grate (TI wood chip boiler)</td>
</tr>
<tr>
<td>Power supply (2)</td>
<td>Connection cable $1)$ 2 x 1.0 mm²</td>
</tr>
<tr>
<td>2 x bus (3)</td>
<td>CAT 5 patch cable grey RJ45 SFTP 1:1 allocation</td>
</tr>
<tr>
<td>Input 1 … 8 (4)</td>
<td>Connection cable $1)$ 1 x 0.75 mm²</td>
</tr>
<tr>
<td>Output 1 … 8 (5)</td>
<td>Connection cable $1)$ 1 x 0.75 mm²</td>
</tr>
</tbody>
</table>

YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0881-5

External power demand 0-10V

You can define an external power demand for the boiler via the analogue module using a 0-10V signal. The type of power demand can be set using the “Source for ext. power demand (0 - off, 1 - 0-10V, 2 - modbus)” parameter. If 0-10V is selected as the source, the boiler enable mechanism is controlled via an input at the analogue module depending on the boiler type. If the signal at the input is above 35%, the boiler starts in continuous load mode; if the signal drops below 30%, the boiler shuts down. By default 0V = 0% and 10V = 100%. This can be changed using the “Invert ext. power demand via analogue input” parameter.

In order to start the boiler via the power request, “Automatic” mode must be set and the release contact (if in use) must be closed.

See "Boiler - General settings" [page 0 ]

<table>
<thead>
<tr>
<th>Boiler type</th>
<th>Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE1 Pellet, P4 Pellet, T4, TX</td>
<td>Module address: 0</td>
</tr>
<tr>
<td></td>
<td>input: 3</td>
</tr>
<tr>
<td>TI</td>
<td>Module address: 1</td>
</tr>
<tr>
<td></td>
<td>input: 8</td>
</tr>
</tbody>
</table>
### 2.2.6 Digital module

The digital module has additional digital inputs and outputs:

#### Connection instructions

<table>
<thead>
<tr>
<th>Port</th>
<th>Cable dimensions / Specifications / Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x Bus (1)</td>
<td>CAT 5 patch cable grey RJ45 SFTP 1:1 allocation</td>
</tr>
<tr>
<td>Output 1 … 8 (2)</td>
<td>Connection cable $^{1)}$ 1 x 0.75 mm²</td>
</tr>
<tr>
<td>24V (3)</td>
<td>Connection cable $^{1)}$ 1 x 1.0 mm²</td>
</tr>
<tr>
<td>Input 1 … 8 (4)</td>
<td>Connection cable $^{1)}$ 1 x 0.75 mm²</td>
</tr>
</tbody>
</table>

YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0881-5
Connection of the second tipping grate T4 130/150 pellets

When using a second tipping grate in conjunction with the T4 130/150 wood chip boiler and fuel “pellets”, this must be connected on the digital module with address “1” according to the following connection example.

Connection instructions

<table>
<thead>
<tr>
<th>Cable</th>
<th>Connection position digital module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wire “1”</td>
<td>GND</td>
</tr>
<tr>
<td>Wire “2”</td>
<td>24V</td>
</tr>
<tr>
<td>Wire “3”</td>
<td>Digital output 1</td>
</tr>
<tr>
<td>Wire “4”</td>
<td>Digital input 8</td>
</tr>
<tr>
<td>Wire “5”</td>
<td>Digital input 7</td>
</tr>
</tbody>
</table>
2.2.7 Connecting the bus cable

For the bus connections between the individual modules cable type LIYCY paired 2x2x0.5 should be used. The connection to the 5-pin plugs should be carried out according to the following diagram:

```
   Braided shield
   White
   Green
   Yellow
   Brown
```

**CAN H**

**CAN L**

**+U_{bus}**

```
   Braided shield
   White
   Green
   Yellow
   Brown
```

2.2.8 Connect the patch cable to the bus plug

To connect a patch cable to a RJ45 bushing and a 5-pin plug, follow the connection diagram below:

```
braided shield
  green
  blue-white
  blue
  green-white
```

**GND**

**CAN L**

**CAN H**

**+U_{bus}**

Patch cable: assignment according to TIA-568B

2.2.9 Setting end jumpers

To ensure smooth running of the bus system, the jumper must be placed on the last module.

To ensure smooth running of the bus system, the jumper must be placed on the last module.

<table>
<thead>
<tr>
<th>End jumper not set</th>
<th>End jumper set</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="End jumper not set" /></td>
<td><img src="image2.png" alt="End jumper set" /></td>
</tr>
</tbody>
</table>

If the contacts at the base of the end jumper are not bridged (image left), it is referred to as “not set”. In this case there is no bus termination. If the contacts are closed (image right), the end jumper is set and the bus connection is terminated.
### 2.2.10 Setting the module address

For hydraulic modules or heating circuit modules it is necessary to set the necessary order with the module addresses. The first board of a module type should always have the address 0, so that the standard hydraulic systems set do not have to be subsequently configured. For further module types rising module addresses (address 1 - 7) are set.

**Important! Only set the module address when the device is disconnected from the power supply!**

<table>
<thead>
<tr>
<th>Module address set</th>
<th>Heating circuit module</th>
<th>Hydraulic module</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>03 – 04</td>
<td>0.1 – 0.6</td>
</tr>
<tr>
<td>1</td>
<td>05 – 06</td>
<td>1.1 – 1.6</td>
</tr>
<tr>
<td>2</td>
<td>07 – 08</td>
<td>2.1 – 2.6</td>
</tr>
<tr>
<td>3</td>
<td>09 – 10</td>
<td>3.1 – 3.6</td>
</tr>
<tr>
<td>4</td>
<td>11 – 12</td>
<td>4.1 – 4.6</td>
</tr>
<tr>
<td>5</td>
<td>13 – 14</td>
<td>5.1 – 5.6</td>
</tr>
<tr>
<td>6</td>
<td>15 – 16</td>
<td>6.1 – 6.6</td>
</tr>
<tr>
<td>7</td>
<td>17 – 18</td>
<td>7.1 – 7.6</td>
</tr>
</tbody>
</table>
Three different pump types are used in all depending on the pump assembly used:

<table>
<thead>
<tr>
<th>WILO Stratos Para</th>
<th>WILO Stratos TEC</th>
<th>WILO Yonos Para</th>
</tr>
</thead>
</table>

Either a 2-pin control cable (WILO Stratos TEC, WILO Yonos Para) or a 4-pin control cable (WILO Stratos Para) is used for the connection depending on the pump type. Please follow the connection instructions below for the wiring depending on the pump type used:

### Pump type with 2-pin control cable

<table>
<thead>
<tr>
<th>Power supply</th>
<th>2-pin control cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>(brown) L</td>
<td>(blue)</td>
</tr>
<tr>
<td>(blue) N</td>
<td>(brown) +</td>
</tr>
<tr>
<td>(yellow-green) PE</td>
<td>(brown) -</td>
</tr>
</tbody>
</table>

Wire the power supply to the pump outlet on the board.

Connect the control cable to the board’s PWM output, making sure that the polarity is correct:
- blue wire to earth
- brown wire to plus

### Pump type with 4-pin control cable

<table>
<thead>
<tr>
<th>Power supply</th>
<th>4-pin control cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>(brown) L</td>
<td>(brown) -</td>
</tr>
<tr>
<td>(blue) N</td>
<td>(white) +</td>
</tr>
<tr>
<td>(yellow-green) PE</td>
<td>(blue)</td>
</tr>
</tbody>
</table>

Wire the power supply to the pump outlet on the board.

Connect the control cable to the board’s PWM output, making sure that the polarity is correct:
- brown wire to earth
- white wire to plus

Do not use the other two wires (blue, black) and insulate if necessary.
3 Overview of the basic functions

3.1 Visual display

A Display of up to six different menus (freely selected)
B Display and change the current user level
C Display and change the current date / time
D Holiday program
E Chimney sweep
F Display of the current operating status of the boiler and switching the boiler on/off
G Quick menu icon for viewing the available quick functions
H Info menu icon for viewing all system information
I System menu icon for opening the system settings All parameters can be displayed/edited depending on the user level
J Display and change the current boiler mode
K Display icons for using froeling-connect
L Brightness sensor for automatically adjusting the brightness of the display
M Status LED for displaying the current operating status
N USB port for connecting a USB stick for software updates
3.1.1 Status LED

The status LED shows the operating status of the system:

- **GREEN flashing** (interval: 5 sec OFF, 1 sec ON): Boiler off
- **GREEN constant**: BOILER SWITCHED ON
- **ORANGE flashing**: WARNING
- **RED flashing**: FAULT

3.1.2 Control icons

**Cancel icon**

Discards any values entered without saving and closes messages.

**Confirm icon**

Confirms any values entered and activates parameters.

**Home icon**

Tapping the Home icon takes you back to the basic display from any menu.

**Info menu icon**

To access all system information. The information is ordered in a circular buffer. The right and left arrows are used to switch between the individual pages.

**Quick menu icon**

Opens the quick menu. Various functions are available depending on the user level, system configuration and current status.

**Pen icon**

If a parameter has the pen symbol beside it, it means that the parameter can be adjusted. If you open the parameter, either the numeric keypad or a list box for changing the value of the parameter will appear.

**System menu icon**

Opens the system settings. Depending on the operating level and system configuration, the various menu items available are organised in a circular buffer which can be navigated using the right and left arrow.
Back icon

Takes you back up one menu level of the system menu. Can be used to return to the basic display.

3.1.3 Display icons

Depending on the selected settings and current status, additional icons may be shown in the upper left section of the display. Tapping the upper left display section takes the user to the “Connection Center”. Here the online portal “froeling-connect.com” can be activated or deactivated.

- froeling-connect.com is not in use or was deactivated by the user.
- Command server error; a connection with the froeling-connect.com server was not able to be established.
- Connection with the froeling-connect.com server is being established.
- froeling-connect.com is available.

Remote control of the boiler can also be activated or deactivated in the “Connection Center”. The prerequisite is that the parameter "Remote control of the boiler can be activated" is set to “YES” in the “System selection” menu under "Boiler remote control".

- Remote control (switching the boiler on and off) by external operators via froeling-connect.com is permitted.
- Remote control (switching the boiler on and off) by external operators via froeling-connect.com is not permitted.
3.2 Selecting the information displays

After the update, the buttons of the freely selectable information displays are not configured. These can be defined by tapping the “+” symbol and also via the “Display settings => Basic display” menu. The selection depends on the configuration. Tapping on an information display takes you directly to the respective menu (except outside air temperature!). The procedure described below is identical for the boiler console and the room console.

If “storage tank 01” is selected and an additional sensor is positioned in the middle of the storage tank, you can select whether two or three temperature values are displayed next to the storage tank symbol.

When displaying three or more temperature values, only five buttons with information displays are possible in total.
3.3 Configuring a holiday program

To configure a holiday program, press the “Suitcase” symbol on the boiler console. In this menu, you can specify the start and end dates and also select which heating circuits are affected during the set time period. An activated heating circuit is regulated to the setback temperature that is set; an activated boiler is not loaded during this time. If Legionella heating is set, this also remains active!

If the start date is set in the future, the “Suitcase” symbol will be highlighted in green.

When the set start time for the holiday program is reached, the boiler mode switches to “Holiday” mode. This will be displayed as text on the boiler console as well as on the room console.

Tapping on the “Suitcase” symbol opens up a dialogue screen, where you can cancel the holiday program prematurely. The boiler then switches to the previously activated mode ("water tap" symbol = domestic hot water, “water tap/radiator” symbol = automatic).
### 4 Initial start-up with setting wizard

#### 4.1 Before switching on for the first time

**NOTICE**

You should have the initial startup carried out by the authorised heating engineer from Froling customer services.

<table>
<thead>
<tr>
<th>4.1.1 Controller check</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Check boards for foreign bodies (pieces of wire, washers, screws ...)</td>
</tr>
<tr>
<td>☐ Carry out a wiring check:</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>☐ Check plug configuration of pumps, mixing valves and other units, which have NOT been prepared by Froling</td>
</tr>
<tr>
<td>☐ Check the connection of the BUS cable for short-circuits</td>
</tr>
<tr>
<td>☐ Check the specified addresses and terminal jumpers on the individual modules (heating circuit modules, hydraulic modules, displays...)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.1.2 Check on the connected units</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Check that all units that are used are connected correctly</td>
</tr>
<tr>
<td>☐ Carry out a wiring check:</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.1.3 System Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Check that the main fuse for the boiler has a sufficient rated amperage</td>
</tr>
</tbody>
</table>

→ See "Mains connection" [page 7]
4.2 General information about the setting wizard

A wide variety of setting wizards are available for the initial start-up of the boiler system. A small selection of these can be found on the “Customer” operating level in the “Quick menu”; the rest are only on the “Service” operating level. The setting wizard can be used to set various sections of the boiler system (boiler, lambda probe, hydraulic system, ...) with guided queries of the controller.

The following setting wizards are available for specific systems. Because they are interdependent, the sequence is automatically determined by the controller.

<table>
<thead>
<tr>
<th>Icon</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Icon" /></td>
<td><strong>Switching on for the first time</strong>  &lt;br&gt; Queries are made regarding language, production number, date and time</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td><strong>Boiler</strong>  &lt;br&gt; Setting for boiler type, boiler output, fuel, return temperature control and boiler-specific options (ignition, filter, calorific value heat exchanger)</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td><strong>Lambda probe</strong>  &lt;br&gt; Selection and calibration of the existing broadband lambda probe</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td><strong>Discharge</strong>  &lt;br&gt; Selection of the existing discharge system (only for boilers with automatic loading)</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td><strong>Hydraulic system</strong>  &lt;br&gt; Selection of the hydraulic system (hydraulic system 1, 2, 3, ...)</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td><strong>Additional components</strong>  &lt;br&gt; Selection and activation of the existing load and control components (heating circuits, DHW tank, solar, difference controller, ...)</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td><strong>Heating up</strong>  &lt;br&gt; Initial filling of the pellet container for pellet and dual fuel boilers; filling of the discharge screw and defining the loading times for the start process for wood chip boilers</td>
</tr>
<tr>
<td><img src="image" alt="Icon" /></td>
<td><strong>Connect</strong>  &lt;br&gt; Setting parameters required for the boiler to use the “froeling-connect.com” online control (IP address, display password, ...)</td>
</tr>
</tbody>
</table>
### Navigation as well as sensor and pump settings

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>If the Info button has a blue background, more information is available for this overview page.</td>
</tr>
<tr>
<td>2</td>
<td>Progress bar for the respective setting wizard</td>
</tr>
<tr>
<td>3</td>
<td>Cancel setting wizard</td>
</tr>
<tr>
<td>4</td>
<td>Setting the address to which the respective sensor was connected</td>
</tr>
<tr>
<td>5</td>
<td>Setting the address to which the respective pump was connected</td>
</tr>
<tr>
<td>6</td>
<td>Defining the control signal of the respective pump. The following selections are available:</td>
</tr>
<tr>
<td></td>
<td>- Pump without control line</td>
</tr>
<tr>
<td></td>
<td>- Field pump / PWM</td>
</tr>
<tr>
<td></td>
<td>- Solar pump / PWM</td>
</tr>
<tr>
<td></td>
<td>- Field pump PWM + valve</td>
</tr>
<tr>
<td></td>
<td>- Solar pump PWM + valve</td>
</tr>
<tr>
<td></td>
<td>- Field pump / 0 - 10 V</td>
</tr>
<tr>
<td></td>
<td>- Solar pump / 0 – 10 V</td>
</tr>
<tr>
<td></td>
<td>- Field pump 0-10V+valve</td>
</tr>
<tr>
<td></td>
<td>- Solar pump 0-10V + valve</td>
</tr>
<tr>
<td></td>
<td>⇨ See &quot;PWM / 0 - 10V settings&quot; [page 116]</td>
</tr>
<tr>
<td>7</td>
<td>Continue to the next step</td>
</tr>
<tr>
<td>8</td>
<td>Go back one step</td>
</tr>
</tbody>
</table>
4.3 Switching on for the first time

Once you have connected the device to the power supply and switched on the main switch, the display begins with a query regarding the basic settings of the system (language, production number of the boiler system, date, and time). Then the basic screen of the touch display is shown.

1: Selection of the controller language

2: Setting the production number (see identification plate)

3: Setting the date and time

4: Display of the basic screen
### 4.4 Starting the setting wizard

1. **Tap the icon to change the user level**

   ![Tap the icon to change the user level](image1)

2. **Type in the service code and confirm**

   ![Type in the service code and confirm](image2)

3. **Tap the icon of the setting wizard**

   ![Tap the icon of the setting wizard](image3)

4. **Tap the “Boiler” setting wizard**

   ![Tap the “Boiler” setting wizard](image4)

5. **The setting wizard loads**

   ![The setting wizard loads](image5)

6. **Read the information text and continue with “YES” to start**

   ![Read the information text and continue with “YES” to start](image6)
### 5.1 Heating - Status

#### Heating circuit mode
Display and setting the heating circuit mode:

- **Auto**: automatic mode; heating phases according to the set heating times
- **Extra heating**: heating circuit is activated for 6 hours.
- **Setback**: setback mode; the heating phases are ignored
- **Continuous setback mode**: Heating circuit is reduced until activation of another mode.
- **Party**: party mode; the current or next setback program is ignored
- **OFF**: switched-off; heating circuit deactivated, only frost protection!

#### Flow temperature setpoint
Shows the calculated flow temperature setpoint.

#### Room temperature
**Prerequisite**: Heating circuit used in conjunction with remote control
Shows the current room temperature.

#### Outside air temp.
Shows the current external temperature.

#### Actual flow temperature
Shows the current flow temperature.
5.1.2 Heating – Temperatures

**Desired room temperature during heating mode**

**Prerequisite:** Heating circuit used in conjunction with remote control

Room temperature which is regulated during the set heating times

**Desired room temperature during setback mode**

**Prerequisite:** Heating circuit used in conjunction with remote control

Room temperature which is regulated outside of the set heating times

**Flow temperature SP at external temperature of +10°C**

First setting point for definition of heating curve

**Flow temperature SP at external temperature of -10°C**

Second setting point for definition of heating curve

**Controller gain room temperature Kp-Rm**

**Prerequisite:** Heating circuit used in conjunction with remote control

Influencing factor of room temperature on the flow temperature of the heating circuit. If there is a deviation in the room temperature of +/- 1°C the set value of the flow temperature is corrected by this value. (Only in conjunction with remote control)

Recommended values:
- Floor heating: 2-3
- Radiators (new build): 4-5
- Radiators (old build): 6-7

**NOTICE!** Observe external influences on the remote control!

**Reduction of flow temperature in setback mode**

The flow temperature is reduced by this value during setback mode.

**External temperature below which the heating circuit pump switches on in heating mode**

If the external temperature exceeds this value during heating, the heating circuit pumps and mixing valve are deactivated.

**External temperature below which the heating circuit pump switches on in setback mode**

If the external temperature falls below this value in setback mode, the heating circuit pumps and mixing valve are activated.

**Maximum heating circuit flow temp.**

Maximum temperature for limiting outfeed temperature at which the heating circuit is supplied.

**Maximum DHW tank flow temp.**

If DHW tank 1 is supplied directly from heating circuit 1, you can limit the maximum flow temperature for the duration of DHW tank loading.

**Frost protection temperature**

If the room temperature or the flow temperature is lower than the set value, the heating circuit pump will be switched on and the heating circuit mixer keeps to the maximum heating circuit flow temperature that is set.

**From which temperature at storage tank top should the overheating protection be activated**

If the temperature at top storage tank exceeds the set value, the heating circuit is activated regardless of mode (boiler, remote control) and set heating times. The flow temperature is controlled to the value set in the parameter “Flow temperature SP at external temperature of -10°C”. The function will remain active until the value falls below 2°C.

**Recommendation:** The overheating protection should be assigned to a high temperature heating circuit (e.g. radiators).
5.1.3 Heating - Times

Setting times

5.1.4 Heating - Service

Heating circuit pump
Used for testing the pump output:
- A 0: Automatic, Off; A 1: Automatic, On
- 1: Manual, On
- 0: Manual, Off

Heating circuit mixing valve OPEN
Used for testing the mixing valve output:
- A 0: Automatic, Off; A 1: Automatic, On
- 1: Manual, On
- 0: Manual, Off

Heating circuit mixing valve CLOSED
Used for testing the mixing valve output:
- A 0: Automatic, Off; A 1: Automatic, On
- 1: Manual, On
- 0: Manual, Off

Mixer runtime
Here you can set the mixer runtime of the mixer in use.
NOTICE! To avoid mixer vibration, do not set value < 150s!

Switch off heating circuit pump when outfeed setpoint is lower than
Prerequisite: Heating circuit is operated without remote control
If a flow temperature setpoint is calculated below the value set, the heating circuit pump switches off the heating circuit pump and the mixing valve closes.

Should this heating circuit heat when there is DHW tank priority?
- NO: During DHW tank loading this heating circuit is deactivated.
- YES: Despite active DHW tank priority, this heating circuit is supplied with heat during DHW tank loading.

From which buffer tank or distributor is the heating circuit supplied (0 = boiler)
Prerequisite: Parameter can only be used in conjunction with multiple house systems (variants)
This parameter defines the allocation of the heat source for this heating circuit:
- 0 = boiler
- 1 = buffer tank 01, ...

High temperature requirement because of DHW tank 1 loading
- NO: The heating circuit is operated according to the selected heating curve.
- YES: Loading of DHW tank from the heating circuit. If there is a requirement from the DHW tank and the criteria for DHW tank loading have been met, the isolating valve immediately clears the way for boiler loading. The heating circuit pump starts running as soon as the “Load if temperature difference between boiler and DHW tank is” criterion is reached. Once DHW tank loading is complete, the heating circuit pump will stop, the isolating valve will remain active for a specified period of time and the heating circuit mixer will close. If time has run out, the heating circuit will go back to being supplied on a weather-compensated basis.

Parameter only available with "heating circuit 1" and generally only used in conjunction with the unit model of the PE1 Pellet pellet boiler!
High temperature requirement because of DHW tank loading

- **NO**: The heating circuit is operated according to the selected heating curve.
- **YES**: The heating circuit is operated according to the selected heating curve. Whilst the DHW tank is loading, the heating circuit is operated at a higher temperature for the duration of the DHW tank loading. Once the DHW tank is loaded, the heating circuit is supplied again according to the heating curve.

**NOTICE!** Parameters for “heating circuit 2” only!

For high temperature requirement don’t look at DHW tank 1

- **NO**: DHW tank 1 is not supplied with heat from the lines of heating circuit 2.
- **YES**: DHW tank 1 is supplied with heat from the lines of heating circuit 2 and requires a higher temperature for the duration of the DHW tank loading.

### 5.1.5 Heating - Heating up program

**Heating up program active**

- **NO**: Heating up program deactivated, all heating circuits are operated according to the selected heating times.
- **YES**: The 30-day program that has been set starts. After the 30 days, the heating circuit that has been selected operates based on the set heating times again.
  - The heating times of the selected heating circuit, as well as the boiler/buffer tank loading times are automatically set to 0:00-24:00 and the external temperature heating limit is ignored.
  - When using a firewood boiler, a corresponding heat supply must be ensured.
  - If the actual flow temperature setpoint required cannot be reached or maintained (e.g. boiler output, ...), then no warning is displayed!
  - In the event of a power failure, the program continues from the point at which it was interrupted.

If the current room temperature falls below the set frost protection temperature, this influences the set flow temperature setpoint of the heating up program.

**NOTE**: Only in conjunction with remote control!

**Current day of the heating up program**

Shows the current day of the heating up program that is running. By adjusting this parameter, you can jump forward or return to a specific day of the program.

**Which heating up program is used**

There are set options for the progression of the flow temperature in heating up programs 1 – 6. With heating up program 7 the flow temperature can be selected freely over the entire 30 days.

Heating up program 8 allows you to pre-define the progression of the flow temperature for each individual day.

**Outfeed setpoint for all days in program 7**

If heating up program 7 is active, the selected heating circuit is adjusted to the specified flow temperature.
Heating up programs

Heating up program 1:  
Heating up program 2:  
Heating up program 3:  
Heating up program 4:  
Heating up program 5:  
Heating up program 6:  
Heating up program 7:  

Configure program 8

Outfeed temperature setpoint on day 1
Outfeed temperature setpoint on day 2
Outfeed temperature setpoint on day 30

If “heating up program 8” is selected, the flow temperature setpoint can be preset for each day using this setting.
Heating circuits used

Heating up program
Service

Use heating circuit 01
Use heating circuit 02
Use heating circuit 18

The number of heating circuits used depends on the system configuration. If only 2 heating circuits are installed, then only 2 heating circuits will be available for selection. The heating up program selected will be used for all heating circuits!

5.1.6 Heating - General settings

Correction value for external sensor

If the outside temperature sensor shows an incorrect value, the value can be adjusted using this parameter.

Heating circuit module to which the external sensor is connected (0 = core module)

If the outside temperature sensor is not connected to the core module, the address of the relevant heating circuit module +1 must be set here. (Sensor 1 on relevant module)

Use room temperature sensor input for room thermostat

NOTICE! This parameter influences all sensor connections which an analogue room sensor can be connected to!

- NO: At the sensor connector of the room sensor, a room sensor must be connected to control the room temperature.
- YES: At the sensor connector of the room sensor, room thermostats can be connected to control the room temperature.

- Contact of room thermostat open: Heating circuit pump deactivated, mixing valve is closed
- Contact of room thermostat closed: Heating circuit pump and mixer control active
5.2 Water

5.2.1 Water - Status

**DHW tank top temperature**
Current temperature of the DHW tank. The DHW tank is heated when the time window for the DHW tank loading is reached and the current temperature of the DHW tank has fallen below the value using the parameter "Reload if DHW tank temperature is below". A loading of the DHW tank takes place when either the time window has elapsed or the temperature value which is set under "Set DHW temperature" is reached.

**DHW tank bottom temperature**
Prerequisite: Solar panel system is regulated by Froling!
Current temperature in the area of the reference sensor of the solar panel system.

**DHW tank pump control**
Specifies the speed of the DHW tank pump as a percentage of maximum speed.

5.2.2 Water - Temperatures

**Set DHW temperature**
When this DHW temperature is reached, DHW tank loading is stopped.

**Reload if DHW tank temperature is below**
If the DHW tank temperature falls below the value set here, the time window is active and the loading source (boiler or buffer tank) indicates the set loading increase, and the DHW tank loading is started.

**Load if temperature difference between buffer tank and DHW tank is**
When the buffer tank top temperature is above the current DHW tank temperature by this value and the time window is active, the DHW tank loading is started. (Only for systems with buffer tanks)

**Setpoint for temperature difference between boiler and DHW tank**
Adjusting the boiler temperature setpoint to reach the desired DHW tank temperature.
Boiler temperature setpoint = Set DHW temperature + difference
If the current boiler temperature setpoint calculated is higher than the result from the above calculation, the boiler temperature setpoint is maintained. (Only for systems without buffer tank)

**Load if temperature difference between boiler and DHW tank is**
When the boiler temperature is above the current DHW tank temperature by this value and the time window is active, the DHW tank loading is started. (Only for systems with buffer tanks)
5.2.3 Water - Times

Setting times

5.2.4 Water - Service

Residual heat use

Prerequisite: Hydraulic system 0 and return temperature control with mixing valve

- YES: Diverts the residual heat to the DHW tank, the “Minimum boiler temperature to release all pumps” parameter is ignored. The pump set to minimum speed until the boiler temperature is lower than the DHW tank temperature + 3°C.

Only load DHW tank once a day

- NO: A DHW loading takes place always when the DHW tank temperature falls below the value, which is set under “Reload if DHW tank temperature is below”, and the time window is active and the heat source (boiler or buffer tank) indicates sufficient temperature.

- YES: If the DHW tank has already been loaded once on the current day, a further DHW tank loading is prevented.

Legionella heating activated

- NO: A legionella heating of the DHW tank is not carried out.

- YES: The DHW tank is heated to the temperature once a week, which is set under the parameter “DHW tank temp. setpoint for legionella heating (same for all DHW tanks)”. When DHW tank loading has finished, the DHW tank loading pumps continue to run for the time set here.

DHW tank temp. setpoint for legionella heating (same for all DHW tanks)

If the parameter “Legionella heating activated” is set to “YES”, the DHW tank is heated to the set temperature on the specified day of the week.

Which buffer tank or heat distributor supplies the heat to this DHW tank (0 = boiler)

Prerequisite: Parameter can only be used in conjunction with multiple house systems (variants)

This parameter defines the allocation of the heat source for this DHW tank:

- 0 = Boiler
- 1 = buffer tank 01, ...

DHW tanks run-on (this parameter applies for all DHW tanks)

Sensor input of DHW tank 01 top sensor

Sensor input to which the DHW tank sensor is connected.

Sensor input of DHW tank 01 solar reference sensor

Sensor input to which the sensor for the DHW tank solar reference is connected.

Pump output of DHW tank 01 pump

Pump outlet to which the boiler loading pump is connected.

Control of DHW tank pump

Definition of control signal for pump type used.

⇨ See “PWM / 0 - 10V settings” [page 116]
<table>
<thead>
<tr>
<th>Minimum DHW tank speed</th>
<th>Maximum DHW tank pump speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment of the minimum speed to the pump type. (Set the pump mode according to pump manufacturer’s instructions)</td>
<td>If you need to limit the maximum speed of the boiler loading pump for systemic reasons, you can do so by adjusting this parameter.</td>
</tr>
</tbody>
</table>
### 5.3 Solar - Status

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Collector temperature</strong></td>
<td>Display of the current temperature at the solar collector.</td>
</tr>
<tr>
<td><strong>Top storage tank solar sensor</strong></td>
<td>Shows the current temperature at the solar reference sensor in the top part of the buffer tank.</td>
</tr>
<tr>
<td><strong>Solar temperature buffer tank bottom</strong></td>
<td>Shows the current temperature at the solar reference sensor in the lower part of the buffer tank.</td>
</tr>
<tr>
<td><strong>Collector return temperature</strong></td>
<td>Display of the current temperature at the collector return.</td>
</tr>
<tr>
<td><strong>Actual power from solar heat meter [kW]</strong></td>
<td>Display of the current output which is generated by the solar collector. The calculation of the output is only performed either when a per litre output of the collector pump has been set or an external volume pulse transmitter is used. In order to perform the calculation more precisely, the use of a collector return feed sensor is recommended.</td>
</tr>
<tr>
<td><strong>Flow through [l/h]</strong></td>
<td>Display of the water quantity currently being pumped through the solar collector.</td>
</tr>
<tr>
<td><strong>Todays yield [kWh]</strong></td>
<td>Display of the heat quantity that has been supplied by the solar panel system today.</td>
</tr>
<tr>
<td><strong>Daily yield 1 day ago [kWh]</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Daily yield 2 days ago [kWh]</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Daily yield 3 days ago [kWh]</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Daily yield 4 days ago [kWh]</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Daily yield 5 days ago [kWh]</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Daily yield 6 days ago [kWh]</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total yield [kWh]</strong></td>
<td>Display of the heat quantity which has been supplied by the solar panel system since activation of the heat meter.</td>
</tr>
<tr>
<td><strong>DHW tank bottom temperature</strong></td>
<td>Current temperature in the area of the reference sensor of the solar panel system.</td>
</tr>
<tr>
<td><strong>Heat exchanger sec. return temperature (line to buffer tank)</strong></td>
<td>Current temperature at heat exchanger flow on the secondary side.</td>
</tr>
<tr>
<td><strong>Collector pump runtime</strong></td>
<td>Display of the total runtime of the collector pump.</td>
</tr>
<tr>
<td><strong>Collector pump control</strong></td>
<td>Display of the current speed of the collector pump as a percentage of maximum speed.</td>
</tr>
<tr>
<td><strong>Pump between heat exchanger and buffer tank</strong></td>
<td>Display of the current speed of the pump between heat exchanger and buffer tank.</td>
</tr>
<tr>
<td><strong>Pump between heat exchanger and DHW tank</strong></td>
<td>Display of the current speed of the pump between heat exchanger and DHW tank.</td>
</tr>
</tbody>
</table>
Diverter valve for top/bottom coils

Prerequisite: Hydraulic system 12 or 13
Current control of the isolating valve on the solar side.

5.3.2 Solar - Temperatures

Boiler target temperature during solar charging
Up to this temperature the DHW tank is heated by the solar system. If the solar panel system is equipped with an isolating valve for switching between DWH tank and buffer solar element, then this parameter is responsible for switching between both of these solar elements.

Temp differential to start collector pump
The collector pump activates when the collector temperature exceeds the reference temperature in the DHW tank or buffer tank by this value.

Temp difference to stop collector pump
The collector pump switches off when the difference between the collector temperature and reference temperature in the DHW tank or buffer tank is lower than this value.

Maximum buffer tank bottom temperature during solar charging
Prerequisite: Hydraulic system 12 or 13
If the sensor for the solar reference temperature in the buffer tank exceeds the specified value, the collector pump is switched off.

Minimum collector temperature
Minimum temperature at collector which must be reached in order for the solar control to start.

Collector/pump protection from a collector temp.
If the measured value of the solar collector sensor exceeds the set value, then the solar collector must cool down by 20°C within 15 minutes, otherwise the solar collector pump stops in order to protect the pump.

Heat exchanger - buffer tank pump start delay
Prerequisite: Hydraulic system 12 or 13
Delay for switching on the pump between heat exchanger and buffer tank.

Heat exchanger – buffer tank pump stop delay
Prerequisite: Hydraulic system 12 or 13
Delay for switching off the pump between heat exchanger and buffer tank.

Buffer tank top solar setpoint (fast loading until this temperature)
Prerequisite: Hydraulic system 12 or 13
When the upper sensor in the buffer tank reaches the specified value, the solar isolating valve switches to the lower area of the buffer tank.

Collector - buffer tank top differential
Prerequisite: Hydraulic system 12 or 13
This is the overcharge for the collector pump controller for the top or bottom temperature in the buffer tank.

Top buffer tank – secondary HE flow difference
Prerequisite: Hydraulic system 12 or 13
This parameter specifies how much the heat exchanger secondary outfeed temperature should be below the collector temperature. If the difference is less than the set value, the speed of the pump between heat exchanger, DHW tank and buffer tank is reduced.
5.3.3 Solar - Service

Solar system

- 1: The solar panel system supplies only the DHW tank
- 2: The solar panel system supplies only the buffer tank
- 3: The solar panel system is expanded with a switch valve and is used to supply two different heat sinks. For example: Switch from domestic hot water tank to buffer tank, or between top and bottom solar elements with the hygienic solar layered tank or modular solar layered tank with 2 solar elements)

NOTICE! This parameter is not displayed when hydraulic system 12 or 13 is set.

Pump output of collector pump

Pump outlet to which the collector pump is connected.

Control of collector pump

Definition of control signal for pump type used.

⇨ See "PWM / 0 - 10V settings" [page 116]

Minimum collector pump speed

Adjustment of the minimum speed to the pump type. (Set the pump mode according to pump manufacturer's instructions)

Maximum collector pump speed

If you need to limit the maximum speed of the collector pump for systemic reasons, you can do so by adjusting this parameter.

Collector monitoring

- YES: The collector pump is switched on at regular intervals for 10 seconds. The time can be defined using the following parameter. If the collector sensor detects an increase in temperature, the pump is kept on. This function is active from 10:00am - 7:00pm and the threshold value of the collector temperature, from which this function is active, is dynamically adjusted.
- NO: The collector pump only starts when the criteria which is defined under parameter “Temp differential to start collector pump” is reached.

Collector monitoring every

If the collector pump is not active within the time window between 10:00am – 19:00pm, this is activated for 10 seconds at the end of the specified time set here. If the collector sensor detects an increase in temperature, the pump is kept on. If no temperature increase on the collector sensor is detected, the collector pump switches off and the time starts to run afresh.

For solar to buffer and DHW tank, the DHW tank has priority

- YES: The DHW tank is loaded until the temperature is reached, which is set under “Set DHW temperature during solar charging”, and only then switched to the buffer tank by means of the switch valve.
- NO: The DHW tank is charged until the temperature difference between the sensor on the solar collector and the solar reference sensor in DHW tank is no longer sufficient. The isolating valve then switches to the buffer tank and supplies it for 20 minutes. Afterwards the collector pump is stopped for 20 minutes and a check is carried out to see if the temperature difference is now sufficient for DHW tank charging.

Solar charging to which buffer tank

This parameter defines the buffer tank to which the solar charging takes place.

Solar charging to which DHW tank

This parameter defines the DHW tank to which the solar charging takes place.

Sensor input of solar collector sensor

Sensor input to which the collector sensor is connected.

Sensor input of solar reference storage tank top sensor

Prerequisite: Hydraulic system 12 or 13

Sensor input to which the solar reference sensor in the top part of the buffer tank is connected.

Sensor input of solar reference storage tank bottom sensor

Sensor input to which the solar reference sensor in the lower part of the buffer tank is connected.
### Sensor input of secondary HE Sensor flow

**Prerequisite:** Hydraulic system 12 or 13

Sensor input to which the sensor at heat exchanger flow on the secondary side is connected.

### Sensor input of collector return sensor

Sensor input to which the sensor for the collector return is connected.

### Pump output of solar isolating valve

Pump outlet to which the solar isolating valve is connected.

### Pump output of storage tank – heat exchanger pump

**Prerequisite:** Hydraulic system 12 or 13

Pump outlet to which the pump between the solar heat exchanger and buffer tank is connected.

### Control of storage tank – heat exchanger pump

**Prerequisite:** Hydraulic system 12 or 13

Definition of control signal for pump type used.

⇨ See "PWM / 0 - 10V settings" [page 116]

### Pump output of DHW tank – heat exchanger pump

**Prerequisite:** Hydraulic System 12

Pump outlet to which the pump between the solar heat exchanger and DHW tank is connected.

### Control of DHW tank – heat exchanger pump

**Prerequisite:** Hydraulic System 12

Definition of control signal for pump type used.

⇨ See "PWM / 0 - 10V settings" [page 116]

### Invert isolating valve

**Prerequisite:** Solar system 3

- **NO:** The pump output, which the solar isolating valve is connected to, is supplied with 230V when the solar panel system supplies energy to the DHW tank solar element. If there is no 230V at this output, then the valve clears the way for the buffer solar element.
- **YES:** If the solar isolating valve switches incorrectly, the way it is controlled can be adjusted using this parameter.

**Prerequisite:** Hydraulic system 12 or 13

- **NO:** The pump output, which the solar isolating valve is connected to, is supplied with 230V when the solar panel system supplies energy to the top part of the buffer tank. If there is no 230V at this output, then the valve clears the way for the lower area of the buffer tank.
- **YES:** If the solar isolating valve switches incorrectly, the way it is controlled can be adjusted using this parameter.

### Is a PT1000 sensor used as a solar sensor?

- **NO:** A KTY81 sensor is used as a collector sensor
- **YES:** A PT1000 sensor is used as a collector sensor

### Collector pump control Kp value

Control parameter for the speed control of the collector pump.

### Collector pumps control Tn value

Control parameter for the speed control of the collector pump.

### WT Sekundär Pumpen Regler Kp Wert

**Prerequisite:** Hydraulic system 12 or 13

Control parameter for the speed control of the pump between the solar heat exchanger and buffer tank, as well as for the pump between the solar heat exchanger and DHW tank (if installed).

### Secondary HE pumps control Tn value

**Prerequisite:** Hydraulic system 12 or 13

Control parameter for the speed control of the pump between the solar heat exchanger and buffer tank, as well as for the pump between the solar heat exchanger and DHW tank (if installed).

### Minimum pump speed secondary HE

**Prerequisite:** Hydraulic system 12 or 13

Adjustment of the minimum speed to the pump type. (Set the pump mode according to pump manufacturer’s instructions)

This parameter applies for the pump between the solar heat exchanger and buffer tank, as well as for the pump between the solar heat exchanger and DHW tank (if installed).
5.3.4 Solar - Heat meter

**Collector temperature**
Display of the current temperature at the solar collector.

**Collector return temperature**
Prerequisite: Hydraulic system 12 or 13
Display of the current temperature at the collector return.

**Actual power from solar heat meter [kW]**
Display of the current output which is generated by the solar collector. The calculation of the output is only performed either when a per litre output of the collector pump has been set or an external volume pulse transmitter is used. In order to perform the calculation more precisely, the use of a collector return feed sensor is recommended.

**Flow through [l/h]**
Prerequisite: External volume pulse transmitter installed
Display of the water quantity currently being pumped through the solar collector.

**Today's yield [kWh]**
Display of the heat quantity that has been supplied by the solar panel system today.

**Daily yield 1 day ago [kWh]**

**Daily yield 2 days ago [kWh]**

**Daily yield 3 days ago [kWh]**

**Daily yield 4 days ago [kWh]**

**Daily yield 5 days ago [kWh]**

**Daily yield 6 days ago [kWh]**

**Total yield [kWh]**
Display of the heat quantity which has been supplied by the solar panel system since activation of the heat meter.

**Nominal flow of collector pump for heat meter [L/h]**
If no external volume pulse transmitter is used, the pump of the heat meter can be activated by entering the per litre output. The flow rate at 100% collector pump speed must be entered here.

**NOTICE!** This parameter can be ignored if using an external volume pulse transmitter.

**Pulse per litre of flow through meter**
If an external volume pulse transmitter is used, adjust this value according to the volume pulse transmitter used. [0.5 – 5 pulses/L]

**Sensor input of collector return sensor**
Sensor input to which the sensor for the collector return is connected.

**Sensor input of heat meter flow temperature sensor**
Sensor input to which the sensor for the heat meter flow temperature is connected.

**Is an external flow through counter used**
- **YES:** An external volume pulse transmitter is in use.
5.4 Buffer tank

5.4.1 Buffer tank - Status

**Buffer tank top temperature**
Shows the current temperature in the top part of the buffer tank.

**Buffer tank temperature, sensor 2**
**Prerequisite:** Master boiler in the cascade or hydraulic system 4 or fuel amount calculation
Shows the current temperature in the top part of the buffer tank.

**Buffer tank temperature, sensor 3**
**Prerequisite:** Master boiler in the cascade or hydraulic system 4 or fuel amount calculation
Shows the current temperature in the lower part of the buffer tank.

**Buffer tank bottom temperature**
Shows the current temperature in the lower part of the buffer tank.

**Buffer tank pump control**
Display of the current speed of the buffer loading pump.

**Buffer tank charge**
**Prerequisite:** Master boiler in the cascade or hydraulic system 4 or fuel amount calculation
Displays the current buffer tank charge.
5.4.2 Buffer tank - Temperatures

**Heating circuit release from following buffer tank temperature**

Temperature value which must be reached to release the heating circuit pumps in the top part of the buffer tank.

*NOTICE! This parameter applies for all available heating circuits!*

**Boiler start if difference between boiler setpoint and top buffer is larger**

If the difference between the upper buffer tank temperature and the boiler temperature setpoint is greater than the specified value, the boiler starts.

**Start of buffer tank charging from charge**

*Prerequisite:* Master boiler in the cascade or hydraulic system 4.

If the buffer tank charge is below the specified value, the boiler starts.

**100% boiler control output when buffer charge is lower than**

*Prerequisite:* Master boiler in the cascade or hydraulic system 4.

If the buffer tank charge is below the specified value, the boiler system runs at nominal load.

**0% boiler output if buffer charge is over**

*Prerequisite:* Master boiler in the cascade or hydraulic system 4.

If the buffer tank charge is greater than the specified value, the boiler system follows the shutdown procedure.

**Buffer tank charge is 100% at boiler setpoint parameter**

*Prerequisite:* Master boiler in the cascade or hydraulic system 4.

The buffer tank charge is 100% if the average temperature of the buffer tank is below the specified boiler setpoint temperature by the specified value. This parameter defines the end point of the charging curve of the buffer tank.

**Buffer tank charge is 0% at the following temperature (absolute value)**

*Prerequisite:* Master boiler in the cascade or hydraulic system 4.

The buffer tank charge is 0% if the average temperature of the buffer tank reaches the specified value. This parameter defines the base point of the charging curve of the buffer tank.

**Buffer tank fully loaded if temperature difference between boiler and bottom buffer tank**

From this difference between the boiler temperature setpoint that has been set and the current temperature in the lower part of the buffer tank, buffer tank loading is stopped.

**Buffer – Buffer difference**

*Prerequisite:* Variant 3

Difference, which must be given for loading a storage tank e.g. in an adjacent building. If this difference is not reached, the storage tank loading stops.
5.4.3 Buffer tank - Times

Setting times

5.4.4 Buffer tank - Service

Enable heating circuit pump 0 according to top buffer temp.

- NO: Release of heating circuit pump 0 according to the boiler temperature parameter "Minimum boiler temperature to release all pumps"
- YES: Release of heating circuit pump 0 according to the temperature in the top part of the buffer tank parameter "Heating circuit release from following buffer tank temperature"

Control buffer tank requests according to system environment

- NO: The start criterion of the boiler is defined via the parameter "Boiler start if difference between boiler setpoint and top buffer is larger".
- YES: All heating circuits and DHW tanks that are connected to the boiler system and activated report requirements back to the controller on the basis of temperature specifications or according to the outside temperature. These requirements are compared with the current temperature in the top buffer tank and if this temperature is too low the boiler is started. If there is no requirement from the system or if the loading criterion is fulfilled, the boiler switches off.

According to system environment, buffer tank request shutdown delay of

If there is no requirement from the heating circuit and DHW tank, the boiler system stops at the end of the specified time.

NOTICE! Parameter only if "Control buffer tank requests according to system environment" parameter is relevant.

Sensor input of storage tank top sensor

Sensor input to which the sensor in the top part of the buffer tank is connected.

Sensor input of storage tank sensor 2

Sensor input to which the sensor in the top part of the buffer tank is connected.

Sensor input of storage tank sensor 3

Sensor input to which the sensor in the bottom part of the buffer tank is connected.

Sensor input of storage tank middle sensor

Sensor input to which the sensor in the mid area of the buffer tank is connected.

Sensor input of storage tank bottom sensor

Sensor input to which the sensor in the bottom part of the buffer tank is connected.

Pump output of storage tank pump

Pump outlet to which the buffer loading pump is connected.

Control of storage tank pump

Definition of control signal for pump type used.

⇨ See "PWM / 0 - 10V settings" [page 116]

Minimum buffer tank pump speed

Adjustment of the minimum speed to the pump type. (Set the pump mode according to pump manufacturer’s instructions)
Maximum buffer tank pump speed

If you need to limit the maximum speed of the store loading pump for systemic reasons, you can do so by adjusting this parameter.

If the boiler is active then charge all buffer tanks

Prerequisite: Variant 3 or variant 4

- **YES**: Starting the boiler due to a heating requirement by the storage tank in the boiler system not only loads this storage tank, but all of the storage tanks in sub-stations. This increases the runtime related to a boiler system start.

Pump outlet for buffer tank relief valve

The isolating valve switches off part of the layered tank until an adjustable temperature has been reached so that the boiler reaches the temperature more quickly. Once this temperature has been reached, the isolating valve switches back and the entire volume of the layered tank is available to the boiler.

Invert pump outlet for buffer relief valve

- **YES**: If the valve switches incorrectly, the way it is controlled can be changed using this parameter.
5.5 Boiler

5.5.1 Boiler - Status

**Boiler temp.**
Display of current boiler temperature.

**Flue gas temperature**
Display of the current flue gas temperature.

**Flue gas setpoint**
Display of the calculated flue gas setpoint.

**Boiler control variable**
Display of the signal for the combustion controller.

**ID fan control**
Display of the current ID fan control.

**ID fan speed**
Display of the current ID fan speed.

**Air flap control**
Shows the current position which the air flap should move to.

**Position of the air flap**
Shows the current position of the air flap.

**Primary air**
Shows the current value of the primary air flap according to controller.

**Position of primary air flap**
Shows the current position of the primary air flap. (Adjusted for the air settings)

**Residual oxygen content**
Displays the current residual oxygen content.

**Oxygen control**

**Calculated boiler setpoint**
Display of the current boiler temperature setpoint depending on the specified hydraulic system.

**Return setpoint calculated**
Prerequisite: Maintaining outfeed through return feed mixer

**Sensor 1**
Display of the current temperature at sensor 1.

**Return sensor**
Prerequisite: Return temperature control with mixing valve or bypass pump
Display of the current temperature at the boiler return.
5.5.2 Boiler - Temperatures

**Boiler temperature setpoint**
The boiler temperature is regulated to this temperature.
Setting range T4: 60 – 90°C
Setting range TI: 70 – 90°C

**Shutdown if current boiler temperature is higher than boiler setpoint +**
If the boiler temperature setpoint is exceeded by this value, the boiler follows the shutdown procedure. The boiler starts up again below the boiler temperature setpoint.

**Always shutdown when boiler maximum setpoint is exceeded by**
If the maximum boiler temperature setpoint is exceeded by this value, the available heating circuit pumps and DHW tank loading pumps are also activated for cooling the boiler. If the current boiler temperature falls below the boiler temperature setpoint, the boiler starts up again.

**Minimum boiler temperature to release all pumps**
When the current boiler temperature reaches this value, the buffer loading pump is started. (Hysteresis: 2°C)

**Minimum return temperature**
Prerequisite: Return temperature control with mixing valve
The minimum temperature value required of the return to the boiler.

**Return setpoint delay**
Prerequisite: Maintaining outfeed through return feed mixer
Waiting time between the calculation for the return temperature setpoint adjustment. Once the specified time has passed, the heating system temperatures are evaluated.

**Return setpoint boost (power influence)**
Prerequisite: Maintaining outfeed through return feed mixer
This parameter determines how heavily the deviation of the actual boiler temperature from the boiler temperature setpoint is weighted.

**Return feed lift at min. dif. at min. output**
**Prerequisite:** Maintaining outfeed through return feed mixer
Minimum difference between boiler temperature setpoint and return temperature setpoint. The temperature difference between the boiler outfeed temperature and boiler return temperature should not be below this value. This parameter applies to partial load of the boiler.

**Return feed lift min. dif. at 100% output**
**Prerequisite:** Maintaining outfeed through return feed mixer
Minimum difference between boiler temperature setpoint and return temperature setpoint. The temperature difference between the boiler outfeed temperature and boiler return temperature should not be below this value. This parameter applies to nominal load of the boiler.
An interpolation is made between the two parameters between partial load and nominal load.

**Heating circuit overheat invariable mode**
**Prerequisite:** Variable mode activated or boiler system in the cascade
The boiler setpoint temperature in heating mode is increased by this value compared to the required flow temperature.

**Use quick throttle function at RL temperature increase**
*YES: Response to fast load change. If quick regulation is switched on, the return temperature is permanently monitored and if it increases unusually quickly (e.g. because a major consumer has dropped out), the feed is immediately reduced to the minimum setting so that the boiler does not overheat.*

**Temperature rise in return feed for quick regulation**
The quick regulation responds to this temperature increase within the set monitoring time.

**Monitoring time of temperature rise in return**
Monitoring time of temperature rise in return (for start of quick regulation)
5.5.3 Boiler - Times

Setting times

5.5.4 Boiler - Service

Variable mode activated

- **NO:** The boiler temperature is regulated to the target boiler temperature set. When used in conjunction with a storage tank, this parameter should be set to “NO”.
- **YES:** The boiler temperature is regulated according to the calculated flow value for the heating circuit/DHW tank.

Mixer runtime

**Prerequisite:** Return temperature control with mixing valve

Setting the runtime of the mixer used for the return temperature control.

**Recommendation:** To reduce mixer vibration, do not set value below 150s!
5.5.5 Boiler - General settings

**Modem installed**
- **NO:** The boiler does not have a modem for data transfer installed.
- **YES:** The boiler has a modem for data transfer installed.

**Memory cycle of data logger**
If the boiler is equipped with a data logger the most important boiler data is stored on an SD card. This parameter specifies at what intervals the recording should be started.

**Output warnings through fault message relays**
- **NO:** When there is an "error" or "alarm" the common fault relay closes.
- **YES:** In addition to an "error" or "alarm", the common fault relay closes when a "warning" is present on the boiler.

**Display temperature in Fahrenheit**
- **NO:** Displayed temperature values and settings are shown in °C.
- **YES:** Displayed temperature values and settings are shown in °F.

**Always log data in °C**
- **YES:** In conjunction with a data logger, all temperature values are saved in °C.
- **NO:** In conjunction with a data logger, all temperature values are saved in °F.

**EEPROM reset**
- **YES:** All boiler settings and system configurations are deleted. The boiler is only functional again once it has been recommissioned by Fröling customer services or authorized installer.

**Send a line break when ASCII data output on COM2**
- **NO:** When a new data set is issued it will be added to the previous one.
- **YES:** A line break for better visualisation is sent between the individual data sets.

**Source for ext. power demand (0 - off, 1 - 0-10V, 2 - Modbus)**

**Invert ext. power demand via analogue input**

**Input external power demand**

**Current external power demand**

**Adopt specified material values**
- **YES:** The preset boiler parameters for the chosen fuel selection are adopted. When the process is completed the parameter changes back to "NO".

**Adopt standard settings (all values are reset)**
- **YES:** Adopting standard factory settings This resets all parameters! Once the settings have been applied, the parameter automatically switches to "NO" and the boiler must be reset; otherwise, boiler functioning is no longer guaranteed.

**Reset counter since last maintenance**
- **NO:** The service hours counter since last maintenance continues to run.
- **YES:** The service hours counter since last maintenance is set to "0".
**Boiler - General settings - MODBUS settings**

**COM 2 is used as a MODBUS interface**
- NO: The COM 2 interface sends the most important boiler values every second.
- YES: The COM 2 interface can be used to connect a MODBUS (RTU/ASCII)

**MODBUS protocol (1 – RTU / 2 – ASCII)**

**Use MODBUS protocol 2014?**

**MODBUS address**

**Boiler - General settings - Operator data**

**Production number**
For unique identification of the boiler on the froeling-connect server, the facility number listed on the identification plate must be set here.

**Boiler number**
By setting the boiler number, this is automatically transferred into the commissioning report when it is saved.

**Customer number**
By setting the customer number, this is automatically transferred into the commissioning report when it is saved.
5.6 Boiler 2

5.6.1 Boiler 2 - Status

Temperature of secondary boiler
Display of the current boiler temperature of the secondary boiler.

Burner relay status
Shows the current status of the burner relay:
- ▪ 0: Secondary boiler not active
- ▪ 1: Secondary boiler active

Secondary boiler pump
Prerequisite: “Isolating valve installed” parameter set to “NO”
Display of the current pump control for the secondary boiler.

Secondary boiler switching valve
Prerequisite: “Isolating valve installed” parameter set to “YES”
Display of the current isolating valve control of the secondary boiler.

Manual start of secondary boiler (only when ID fan is switched off)
- ▪ OFF: Secondary boiler is controlled according to the program that is set
- ▪ ON: Secondary boiler is activated immediately

NOTICE! Burner blockage noted.
5.6.2 Boiler 2 - Temperatures

**Secondary boiler start delay**
If there is a requirement from the heating circuit or DHW tank and the buffer tank or boiler has insufficient temperature, the secondary boiler starts after the specified delay time set here.

**Secondary boiler start, if buffer tank top temperature is below**
If the temperature in the top part of the buffer tank falls below the specified value, the secondary boiler is started once the set duration has elapsed.

**NOTICE! Parameter only relevant if heating circuit and DHW tank are regulated externally!**

**Secondary boiler minimum runtime**
If the secondary boiler is started, it will run for at least the length of time set here.

**Minimum temperature of secondary boiler**
When the secondary boiler reaches the specified temperature, the loading pump is started and switches the isolating valve.

**Temperature difference between secondary boiler and buffer tank**
Temperature difference between secondary boiler and upper temperature in layered tank to activate the loading pump of the secondary boiler.

**Oil valve shut delay**
If the current boiler temperature of the secondary boiler falls below the value that is set under "Minimum temperature of secondary boiler", the isolating valve only switches once the set duration has elapsed.

**Secondary boiler delivery temperature**
**Prerequisite:** Hydraulic system 3 in conjunction with a manually loaded secondary boiler.
If the secondary boiler exceeds the specified temperature, the isolating valve switches and skims the boiler.
5.6.3 Boiler 2 - Service

Control secondary boiler variably to the target value
- **NO**: The secondary boiler is operated with the boiler temperature that is set on the secondary boiler thermostat.
- **YES**: The boiler temperature of the secondary boiler is regulated to the target temperature specified from the heating circuit or DHW tank.

Sensor input of backup boiler sensor
Sensor input to which the sensor for the secondary boiler is connected.

Pump output of secondary boiler unloading
Pump outlet to which the loading pump of the secondary boiler or the secondary boiler switch valve is connected.

Control of boiler 2 pump
Definition of control signal for pump type used.
- See "PWM / 0 - 10V settings" [page 116]

Maximum speed of boiler 2 pump
If you need to limit the maximum speed of the loading pump of the secondary boiler for systemic reasons, you can do so by adjusting this parameter.

Invert secondary boiler isolating valve
- **YES**: If the valve switches incorrectly, the way it is controlled can be adjusted using this parameter.

Burner relay
- **A**: Secondary boiler is controlled according to the program that is set
- **1**: Secondary boiler was started manually.
- **0**: Secondary boiler was stopped manually.

5.7 Fuel

5.7.1 Fuel - Service

Fuel selection
- **Dry chip**
- **Wet chip**
- **Pellets**

After setting the fuel a prompt appears to adopt the specified material values. This must be confirmed with "YES".

Adopt specified material values
- **YES**: The preset boiler parameters for the chosen fuel selection are adopted. When the process is completed the parameter changes back to "NO".
5.8 Feed system

5.8.1 Feed system - Screw 1 on LB

System menu  Feed system  Screw 1 on LB

Screw active
- NO: Screw 1 on feed system module is not used.
- YES: Screw 1 on feed system module is used.
  - “Screw 1” output
  - “Drop box cover 1” input
  - “Light barrier 1” connection

Nominal current for screw 1
Nominal current for the motor of “screw 1” motor according to the identification plate on the motor.

During troubleshooting of feed screw, it turns backwards for
Duration, how long should the feed screw turn backwards during troubleshooting.

During troubleshooting of feed screw, it turns forwards for
Duration, how long should the feed screw turn forwards during troubleshooting.

Switch-on delay feed screw light barrier
The time for which the light barrier must consistently recognise material to activate material recognition in the drop box.

Switch-off delay feed screw light barrier
The time for which the light barrier must consistently recognise no material to deactivate material recognition in the drop box.

Maximum idle time of screw
Time delay until an error in the material recognition is tripped.

Forced infeed after

Forced infeed maximum runtime

Forced infeed attempts

Switch-on delay feed screw light barrier

Switch-off delay feed screw light barrier

Minimum current monitoring active

Service hours of screw on LB

Parameter overview
Feed system

5

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5.8.2 Feed system - Screw 2 on LB

**Screw active**

- **NO:** Screw 2 on feed system module is not used.
- **YES:** Screw 2 on feed system module is used.
  - “Screw 2” output
  - “Gravity shaft cover 2” input
  - “Light barrier 2” connection

**Nominal current for screw 2**

Nominal current for the motor of “screw 2” motor according to the identification plate on the motor.

**Maximum idle time of screw**

Time delay until an error in the material recognition is tripped.

**Forced infeed after**

**Forced infeed maximum runtime**

**Forced infeed attempts**

**Screw at address**

**Minimum current monitoring active**

**Service hours of screw on LB**

**During troubleshooting of feed screw, it turns backwards for**

Duration, how long should the feed screw turn backwards during troubleshooting.

**During troubleshooting of feed screw, it turns forwards for**

Duration, how long should the feed screw turn forwards during troubleshooting.

**Switch-on delay feed screw light barrier**

The time for which the light barrier must consistently recognise material to activate material recognition in the drop box.

**Switch-off delay feed screw light barrier**

The time for which the light barrier must consistently recognise no material to deactivate material recognition in the drop box.
5.8.3 Discharge system - Rotary agitator

Mode

- **OFF**: Rotary agitator with separate drive system is deactivated.
- **Auto FULL / EMPTY**: The boiler controller makes the decision whether the bunker is full or empty based on the measured current of the motor of the separate rotary agitator drive, which gives the runtime of the rotary agitator with separate drive.
- **Bunker FULL**: The runtime of the rotary agitator with separate drive system is defined via the parameter "Weighting of screw runtime when bunker is FULL", regardless of whether the bunker is full or empty.
- **Bunker EMPTY**: The runtime of the rotary agitator with separate drive system is defined via the parameter "Weighting of screw runtime when bunker is EMPTY", regardless of whether the bunker is full or empty.

Nominal current for rotary agitator

Setting the nominal current of the rotary agitator with separate drive according to the identification plate on the motor.

Bunker FULL at % of nominal current

Threshold value in % of motor nominal current from the rotary agitator with separate drive above which a full bunker is assumed.

- If the actual power consumption exceeds the set percentage value of the motor nominal current, the boiler controller evaluates this as a full bunker and the control of the rotary agitator with separate drive is defined via the "Weighting of screw runtime when bunker is FULL" parameter.
- If the actual power consumption falls below the set percentage value of the motor nominal current, the boiler controller evaluates this as an empty bunker and the control of the rotary agitator with separate drive is defined via the "Weighting of screw runtime when bunker is EMPTY" parameter.

Cycle time:

Cycle time for calculating the runtime of the rotary agitator with separate drive system.

Weighting of screw runtime when bunker is FULL

The total runtime of all screws is added up within the cycle time. This parameter defines the runtime of the rotary agitator with separate drive when bunker is full in the next cycle.

Weighting of screw runtime when bunker is EMPTY

The total runtime of all screws is added up within the cycle time. This parameter defines the runtime of the rotary agitator with separate drive when the bunker is empty in the next cycle.

Rotary agitator at address

Module address setting: Screw output 1 at feed system module with address 0.

Minimum current monitoring active

- **YES**: A failure of measured phase is detected.

Service hours of rotary agitator
5.8.4 Feed system - Cyclone 1

### Cyclone active
- **NO**: Cyclone on the vacuum discharge system is not in use.
- **YES**: Cyclone on the vacuum discharge system is in use.

### Preliminary suction time
**Prerequisite**: Feed system suction screw
After the start of a filling process, the suction screw starts after this period of delay.

### Maximum time until switching of probe
**Prerequisite**: Feed system 4 probe switch or 8 probe switch
Time period, during which the cyclone must reach a fill level of 100% from a probe. If this time is exceeded, the change-over unit automatically changes to the next probe. If all probes are started and the fill level of 100% in the cyclone is not reached, an error message appears on the display.

### Probe suction reversal for
**Prerequisite**: Feed system 4 probe switch or 8 probe switch
Before switching to the next probe, each probe that was last used is back-flushed for the time set.

### Max. runtime of suction fan
**Prerequisite**: Feed system bag silo or suction screw
If the 100% fill level in the cyclone has not been reached within the specified runtime, the suction turbine switches off.

### Vacuum + screw filling run-on, applies after reaching the MAX fill level

### Suction run-on
When the fill level sensor detects fuel in the cyclone, the suction turbine remains active for the time set.

### Address at screw
Address of output at discharge module, to which the suction screw motor is connected.
<table>
<thead>
<tr>
<th>Position 8 of change-over unit is used?</th>
<th>Service hours of suction unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service hours of suction screw</td>
<td></td>
</tr>
</tbody>
</table>
5.8.5 Feed system - Cyclone 2

Cyclone active

- **NO**: Cyclone on the vacuum discharge system is not in use.
- **YES**: Cyclone on the vacuum discharge system is in use.

Preliminary suction time

**Prerequisite**: Feed system suction screw

After the start of a filling process, the suction screw starts after this period of delay.

Maximum time until switching of probe

**Prerequisite**: Feed system 4 probe switch or 8 probe switch

Time period, during which the cyclone must reach a fill level of 100% from a probe. If this time is exceeded, the change-over unit automatically changes to the next probe. If all probes are started and the fill level of 100% in the cyclone is not reached, an error message appears on the display.

Probe suction reversal for

**Prerequisite**: Feed system 4 probe switch or 8 probe switch

Before switching to the next probe, each probe that was last used is back-flushed for the time set.

Max. runtime of suction fan

**Prerequisite**: Feed system bag silo or suction screw

If the 100% fill level in the cyclone has not been reached within the specified runtime, the suction turbine switches off.

Vacuum + screw filling run-on, applies after reaching the MAX fill level

Suction run-on

When the fill level sensor detects fuel in the cyclone, the suction turbine remains active for the time set.

Address at screw

Address of output at discharge module, to which the suction screw motor is connected.

Screw cycle

Nominal current for discharge screw

Nominal current of the suction screw motor according to the identification plate on the motor.

During troubleshooting of suction screw, this turns backwards for

Duration, how long should the suction screw turn backwards during troubleshooting.

During troubleshooting of suction screw, this turns forwards for

Duration, how long should the suction screw turn forwards during troubleshooting.

Minimum current monitoring active

- **YES**: A failure of measured phase is detected.

Vibration timing

The default vibration interval timing is 60%:

time basis: 100 sec. → 60 sec. on / 40 sec. pause

Position 1 of change-over unit is used?

Position 2 of change-over unit is used?

Position 3 of change-over unit is used?

Position 4 of change-over unit is used?

Position 5 of change-over unit is used?

Position 6 of change-over unit is used?

Position 7 of change-over unit is used?
<table>
<thead>
<tr>
<th>Position 8 of change-over unit is used?</th>
<th>Service hours of suction unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service hours of suction screw</td>
<td></td>
</tr>
</tbody>
</table>
5.9 Network pump

5.9.1 Network pump - Status

System menu ➔ Network pump ➔ Information

Network return temperature
Display of the current return temperature of the remote line.

Network pump speed
Specifies the current speed of the network pump.

Return temperature feeder 1
Prerequisite: Variant 1 and feeder pump House 1 installed
Display of the current return temperature from feeder 1.

Speed, feeder 1
Prerequisite: Variant 1 and feeder pump House 1 installed
Display of the current speed of feeder pump 1.

Return temperature feeder 2
Prerequisite: Variant 2 or variant 3 and feeder pump House 2 installed
Display of the current return temperature from feeder 2.

Speed, feeder 2
Prerequisite: Variant 2 or variant 3 and feeder pump House 2 installed
Display of the current speed of feeder pump 2.

Return temperature feeder 3
Prerequisite: Variant 2 or variant 3 and feeder pump House 3 installed
Display of the current return temperature from feeder 3.

Speed, feeder 2
Prerequisite: Variant 2 or variant 3 and feeder pump House 3 installed
Display of the current speed of feeder pump 3.

Return temperature feeder 4
Prerequisite: Variant 2 or variant 3 and feeder pump House 4 installed
Display of the current return temperature from feeder 4.

Speed, feeder 4
Prerequisite: Variant 2 or variant 3 and feeder pump House 4 installed
Display of the current speed of feeder pump 4.
5.9.2 Network pump - Temperatures

**Network return setpoint**

**Prerequisite:** Network pump installed

The network return setpoint is regulated to the value set here. When the network return temperature reaches the specified value, the network pumps starts up at minimum speed.

**Return temperature setpoint feeder 1**

**Prerequisite:** Variant 1 and feeder pump House 1 installed

The return temperature from feeder 1 is regulated to the value set here. When the network return temperature from feeder 1 reaches the specified value, the feeder pump House 1 starts up at minimum speed.

**Return temperature setpoint feeder 2**

**Prerequisite:** Variant 2 or variant 3 and feeder pump House 2 installed

The return temperature from feeder 2 is regulated to the value set here. When the network return temperature from feeder 2 reaches the specified value, the feeder pump House 2 starts up at minimum speed.

**Return temperature setpoint feeder 3**

**Prerequisite:** Variant 2 or variant 3 and feeder pump House 3 installed

The return temperature from feeder 3 is regulated to the value set here. When the network return temperature from feeder 3 reaches the specified value, the feeder pump House 3 starts up at minimum speed.

**Return temperature setpoint feeder 4**

**Prerequisite:** Variant 2 or variant 3 and feeder pump House 4 installed

The return temperature from feeder 4 is regulated to the value set here. When the network return temperature from feeder 4 reaches the specified value, the feeder pump House 4 starts up at minimum speed.
5.9.3 Network pump - Service

**System menu Network pump**

**Only switch on the network pump when required by the buffer tank (variant 3 / 4)**

**Prerequisite:** Variant 3 or variant 4
- **NO:** The network pump is activated as soon as a consumer in the hydraulic system requires heat.
- **YES:** The network pump is only activated when one or more layered tanks require heat.

**NOTICE!** Parameter only relevant if a layered tank is installed in all buildings to be supplied!

**Sensor input of network return temperature sensor**
Sensor input to which the sensor for the network return temperature is connected.

**Pump output of network pump**
Pump outlet to which the collector pump is connected.

**Control of network pump**
Definition of control signal for pump type used.
⇒ See “PWM / 0 - 10V settings” [page 116]

**Minimum speed of network pump**
Adjustment of the minimum speed to the pump type. (Set the pump mode according to pump manufacturer’s instructions)

**Maximum speed for network pump**
If you need to limit the maximum speed of the network pump for systemic reasons, you can do so by adjusting this parameter.

**Sensor input of feeder 1 return sensor**
**Prerequisite:** Variant 1 and feeder pump House 1 installed
Sensor input to which the sensor for the return feeder 1 is connected.

**Pump output of feeder 1 pump**
**Prerequisite:** Variant 1 and feeder pump House 1 installed
Pump outlet to which the pump for feeder 1 is connected.

**Control of feeder pump 1**
**Prerequisite:** Variant 1 and feeder pump House 1 installed
Definition of control signal for pump type used.
⇒ See “PWM / 0 - 10V settings” [page 116]

**Minimum speed for feeder pump 1**
**Prerequisite:** Variant 1 and feeder pump House 1 installed
Adjustment of the minimum speed to the pump type. (Set the pump mode according to pump manufacturer’s instructions)

**Maximum speed for feeder pump 1**
**Prerequisite:** Variant 2 or variant 3 and feeder pump House 1 installed
If you need to limit the maximum speed of the feeder pump 1 for systemic reasons, you can do so by adjusting this parameter.

**Sensor input of feeder 2 return sensor**
**Prerequisite:** Variant 2 or variant 3 and feeder pump House 2 installed
Sensor input to which the sensor for the return feeder 2 is connected.

**Pump output of feeder 2 pump**
**Prerequisite:** Variant 2 or variant 3 and feeder pump House 2 installed
Pump outlet to which the pump for feeder 2 is connected.

**Control of feeder pump 2**
**Prerequisite:** Variant 2 or variant 3 and feeder pump House 2 installed
Definition of control signal for pump type used.
⇒ See “PWM / 0 - 10V settings” [page 116]

**Minimum speed for feeder pump 2**
**Prerequisite:** Variant 2 or variant 3 and feeder pump House 2 installed
Adjustment of the minimum speed to the pump type. (Set the pump mode according to pump manufacturer’s instructions)

**Maximum speed for feeder pump 2**
**Prerequisite:** Variant 2 or variant 3 and feeder pump House 2 installed
If you need to limit the maximum speed of the feeder pump 2 for systemic reasons, you can do so by adjusting this parameter.
### Sensor input of feeder 3 return sensor
**Prerequisite:** Variant 2 or variant 3 and feeder pump<br>House 3 installed
Sensor input to which the sensor for the return feeder 3 is connected.

### Pump output of feeder 3 pump
**Prerequisite:** Variant 2 or variant 3 and feeder pump<br>House 3 installed
Pump outlet to which the pump for feeder 3 is connected.

### Control of feeder pump 3
**Prerequisite:** Variant 2 or variant 3 and feeder pump<br>House 3 installed
Definition of control signal for pump type used.
⇨ See "PWM / 0 - 10V settings" [page 116]

### Minimum speed for feeder pump 3
**Prerequisite:** Variant 2 or variant 3 and feeder pump<br>House 3 installed
Adjustment of the minimum speed to the pump type. (Set the pump mode according to pump manufacturer’s instructions)

### Maximum speed for feeder pump 3
**Prerequisite:** Variant 2 or variant 3 and feeder pump<br>House 3 installed
If you need to limit the maximum speed of the feeder pump 3 for systemic reasons, you can do so by adjusting this parameter.

### Sensor input of feeder 4 return sensor
**Prerequisite:** Variant 2 or variant 3 and feeder pump<br>House 4 installed
Sensor input to which the sensor for the return feeder 4 is connected.

### Pump output of feeder 4 pump
**Prerequisite:** Variant 2 or variant 3 and feeder pump<br>House 4 installed
Pump outlet to which the pump for feeder 4 is connected.

### Control of feeder pump 4
**Prerequisite:** Variant 2 or variant 3 and feeder pump<br>House 4 installed
Definition of control signal for pump type used.
⇨ See "PWM / 0 - 10V settings" [page 116]

### Minimum speed for feeder pump 4
**Prerequisite:** Variant 2 or variant 3 and feeder pump<br>House 4 installed
Adjustment of the minimum speed to the pump type. (Set the pump mode according to pump manufacturer’s instructions)

### Maximum speed for feeder pump 4
**Prerequisite:** Variant 2 or variant 3 and feeder pump<br>House 4 installed
If you need to limit the maximum speed of the feeder pump 4 for systemic reasons, you can do so by adjusting this parameter.
5.10 Cascade

5.10.1 Cascade - Status

- **Buffer tank charge**
  Displays the current buffer tank charge.

5.10.2 Cascade - Backup boiler

- **Slave boiler boiler temperature**
  Display of the current boiler temperature of the backup boiler.
- **Slave boiler OK**
  Display of whether the backup boiler is ready for operation.
- **Slave boiler is heating**
  Display of whether the backup boiler is in “Heating” operating status.
- **Slave boiler control variable**
  Display of the signal for the combustion controller.
- **Boiler charging pump speed**
  Display of the current speed of the boiler loading pump.
5.10.3 Cascade - Temperatures

**Buffer tank charge is 100% at boiler setpoint parameter**

The buffer tank charge is 100% if the average temperature of the buffer tank is below the specified boiler setpoint temperature by the specified value. This parameter defines the end point of the charging curve of the buffer tank.

**Buffer tank charge is 0% at the following temperature (absolute value)**

The buffer tank charge is 0% if the average temperature of the buffer tank reaches the specified value. This parameter defines the base point of the charging curve of the buffer tank.

**Start point 1 at buffer tank charge**

If the buffer tank charge is lower than this value, the first boiler is started. This can be the boiler with the highest priority or with the fewest operating hours and consequently both the master and the slave boiler.

**Start point 2 at buffer tank charge**

If the buffer tank charge is lower than this value, the second boiler is started.

**Start point 3 at buffer tank charge**

If the buffer tank charge is lower than this value, slave boilers 3 and 4 are started.
Quick start if buffer tank discharge is greater than (% / 10min)]

If the storage tank discharge is greater than the set value within 10 minutes, the boiler with the greatest rated heat output will be started (quick start).

Reduce the overall output of the cascade before the storage tank is fully loaded

When the buffer tank charge exceeds the value which is set under “Start point 1 at buffer tank charge”, the boiler control variable for the boilers that are still active will be reduced using the boiler loading pump.

5.10.4 Cascade - Service

Boiler priorities are used to specify the order in which the boilers start. Where boilers have the same priority, the boiler currently with the fewest operating hours always starts first.

With this setting the master boiler always starts first as it has the highest priority, the boilers then start in numerical order.

With this setting the current number of operating hours is used as the start criterion as all boilers have equal priority.

| Start priority of the master boiler | 1 |
| Start priority of slave boiler 1    | 2 |
| Start priority of slave boiler 2    | 3 |
| Start priority of slave boiler 3    | 4 |

Start priority of the master boiler | 1 |
Start priority of slave boiler 1    | 1 |
Start priority of slave boiler 2    | 1 |
Start priority of slave boiler 3    | 1 |
5.11 Difference regulator

5.11.1 Difference regulator - Status

Heat source sensor
Display of the current heat source temperature of the differential controller (e.g. tiled stove with water pocket, ...)

Pump speed
Specifies the current speed of the differential controller pump.

Heat sink sensor
Display of the current temperature of the heat sink for the differential controller (e.g. layered tank, ...)

5.11.2 Difference regulator - Temperatures

Startup difference
Temperature difference between heat source and heat sink which must be reached to activate the pump of the differential controller.

Minimum temperature for heat source
If the temperature in the heat source falls below this value the differential controller will be deactivated.

Shutdown difference
If the temperature difference between the heat source and the heat sink falls below this value, the pump of the differential controller is deactivated.

Maximum temperature for heat sink
When the heat sink reaches this value, the pump of the differential controller is deactivated.
5.11.3 Difference regulator - Times

**Diff. control start time**
If after reaching the specified time, the criteria for starting the differential controller is permitted, then the pumps of the differential controller starts.

**Diff. control stop time**
Also when the criteria for starting the differential controller is fulfilled, the differential controller is only active until the specified time.

5.11.4 Difference regulator - Service

**Pump output of diff. control pump**
Pump outlet to which the pump of the differential controller is connected.

**Control of diff. control pump**
Definition of control signal for pump type used.
⇒ See “PWM / 0 - 10V settings” [page 116]

**Minimum pump speed**
Adjustment of the minimum speed to the pump type. (Set the pump mode according to pump manufacturer’s instructions)

**Maximum pump speed**
If you need to limit the maximum speed of the pump of the differential controller for systemic reasons, you can do so by adjusting this parameter.

**Sensor input of heat source sensor**
Sensor input to which the heat source sensor is connected.

**Sensor input of heat sink sensor**
Sensor input to which the heat sink sensor is connected.

**Sensor monitoring**
- **YES**: If temperatures around freezing point occur, an error message appears on the display.
- **NO**: The error messages of the differential controller sensor are suppressed.
5.12 Circulation pump

5.12.1 Circulation pump - Status

**Return temperature in secondary circulation line**
Display of the current temperature at the return feed sensor of the circulation line.

**Flow switch on the domestic hot water line**
- 0: Flow switch detects no flow rate.
- 1: Flow switch detects flow rate.

**NOTICE!** If the parameter "Return sensor present" is set to "NO", 0°C is permanently displayed.

**Speed of the circulation pump**
Specifies the current speed of the circulation pump.

5.12.2 Circulation pump - Temperatures

**Return sensor present**
- **NO:** The circulation pump is controlled according to time program. In conjunction with the use of a flow valve, the circulation pump is also activated at a signal from the flow valve.
- **YES:** The circulation pump is controlled according to time program and temperature at the return circulation line. In conjunction with the use of a flow switch, the circulation pump is also activated at a signal from the flow switch.

**NOTICE!** Connect the flow sensor as the return sensor!

**Switch off the pump at what return temperature in the circulation line**
If the set temperature at the return circulation line is reached, the circulation pump will be deactivated.

**NOTICE!** Parameter only relevant when using a return feed sensor in the circulation line!
5.12.3 Circulation pump - Times

Setting times

5.12.4 Circulation pump - Service

Sensor input of circulation return sensor
Sensor input to which the sensor at the return line of the circulation is connected.

Which sensor is used for the flow switch
Sensor input to which the flow switch is connected.

Pump output of circulation pump
Pump outlet to which the circulation pump is connected.

Control of circulation pump
Definition of control signal for pump type used.
⇨ See "PWM / 0 - 10V settings" [page 116]

Maximum speed of the circulation pump
If you need to limit the maximum speed of the circulation pump for systemic reasons, you can do so by adjusting this parameter.
5.13 Manual


When exiting the “Manual operation” menu, all active parameters are automatically set to “OFF”! The parameters displayed depend on the boiler configuration!

**Stoker ON**
- ON: The stoker screw drive is activated.

**Feed screw ON**
- ON: The feed screw drive is activated.

**Suction screw of cyclone 1**
- ON: The drive of the suction screw at cyclone 1 is activated.

**Suction screw of cyclone 2**
- ON: The drive of the suction screw at cyclone 2 is activated.

**Rotary valve ON**
- ON: The drive of the rotary valve is activated.

**Screw 1**
- ON: The drive of screw 1 on feed system module is activated.

**Screw 2**
- ON: The drive of screw 2 on feed system module is activated.

**Bunker filling rotary agitator**
- ON: In the case of a rotary agitator with a separate drive system, the head of the rotary agitator is operated separately from the discharge screw.

**WOS drive**
- ON: The heat exchanger cleaning system is activated.

**Back burn flap drive**
- ON: Burn back flap is opened.

**Oufeder - manual**
- ON: The stoker and feed screw drive is activated.

**Ash screw**
- ON: The ash screw drive is activated.

**Grate tip drive**
- ON: The tipping grate is opened.

**Rinse the condenser manually – only possible if boiler off / on standby**
- ON: The solenoid opens and the calorific value heat exchanger is cleaned.

NOTICE! This parameter can only be activated when the boiler is in “Standby” or “Boiler off” status.
5.13.2 Manual - Digital outputs

The parameters displayed depend on the boiler configuration!

- A 0: Automatic, Off; A 1: Automatic, On
- 1: Manual, On
- 0: Manual, Off

**Heating Circuit 1 Mixer OPEN**

- :

**Ignition**

- :
5.13.3 Manual - Analogue outputs

The parameters displayed depend on the boiler configuration!

- **A 0**: Automatic, Off; **A 1-100%**: Automatic, with % value ON
- **1-100%**: Manual, with % value ON
- **0%**: Manual, Off

**Primary air**
- 

**Pump 0.1**
- 

5.13.4 Manual - Digital inputs

The parameters displayed depend on the boiler configuration!

- **A 0**: Automatic, Off; **A 1**: Automatic, On
- **1**: Manual, On
- **0**: Manual, Off

**Cyclone 1 max sensor**
- 

**Door contact switch**
- 

**Hi-limit stat input**
- 

**E-stop input**
- 

**5.14 System**

### 5.14.1 System - Settings

**Setting - Boiler temperature**

#### Boiler temperature setpoint

The boiler temperature is regulated to this temperature.

**Setting range T4: 60 – 90°C**

**Setting range T1: 70 – 90°C**

#### Shutdown if current boiler temperature is higher than boiler setpoint +

If the boiler temperature setpoint is exceeded by this value, the boiler follows the shutdown procedure. The boiler starts up again below the boiler temperature setpoint.

#### Always shutdown when boiler maximum setpoint is exceeded by

If the maximum boiler temperature setpoint is exceeded by this value, the available heating circuit pumps and DHW tank loading pumps are also activated for cooling the boiler. If the current boiler temperature falls below the boiler temperature setpoint, the boiler starts up again.

#### Minimum boiler temperature to release all pumps

When the current boiler temperature reaches this value, the buffer loading pump is started. (Hysteresis: 2°C)

#### Minimum return temperature

**Prerequisite:** Return temperature control with mixing valve

The minimum temperature value required of the return to the boiler.

#### Return setpoint delay

**Prerequisite:** Maintaining outfeed through return feed mixer

Waiting time between the calculation for the return temperature setpoint adjustment. Once the specified time has passed, the heating system temperatures are evaluated.

#### Return setpoint boost (power influence)

**Prerequisite:** Maintaining outfeed through return feed mixer

This parameter determines how heavily the deviation of the actual boiler temperature from the boiler temperature setpoint is weighted.

#### Return feed lift at min. dif. at min. output

**Prerequisite:** Maintaining outfeed through return feed mixer

Minimum difference between boiler temperature setpoint and return temperature setpoint. The temperature difference between the boiler outfeed temperature and boiler return temperature should not be below this value. This parameter applies to partial load of the boiler.

#### Return feed lift min. dif. at 100% output

**Prerequisite:** Maintaining outfeed through return feed mixer

Minimum difference between boiler temperature setpoint and return temperature setpoint. The temperature difference between the boiler outfeed temperature and boiler return temperature should not be below this value. This parameter applies to nominal load of the boiler.

An interpolation is made between the two parameters between partial load and nominal load.

#### Heating circuit overheat invariable mode

**Prerequisite:** Variable mode activated or boiler system in the cascade

The boiler setpoint temperature in heating mode is increased by this value compared to the required flow temperature.

#### Use quick throttle function at RL temperature increase

- **YES:** Response to fast load change. If quick regulation is switched on, the return temperature is permanently monitored and if it increases unusually quickly (e.g. because a major consumer has dropped out), the feed is immediately reduced to the minimum setting so that the boiler does not overheat.
**Temperature rise in return feed for quick regulation**

The quick regulation responds to this temperature increase within the set monitoring time.

**Monitoring time of temperature rise in return**

Monitoring time of temperature rise in return (for start of quick regulation)

---

### Setting - Slide-on duct

- **System menu**
- **System**
- **Setting**
- **Slide-on duct**

---

### Slide-on duct temperature

Display of the current reference temperature for the cooling of the slide-on duct and burn through elbow. Start and stop values for the pump control refer to this temperature.

### SoDC pump control

Display of the current pump control for the slide-on duct cooling.

### Slide-on duct cooling run-on

Run-on time of the pump control for the slide-on duct cooling.

### Activate slide-on duct cooling if temperature above

If the actual temperature in the slide-on duct exceeds the set value, the pump starts to run at minimum speed to cool the slide-on duct.

### Warning if temperature in slide-on duct/burn through elbow above

If the actual temperature in the slide-on duct or burn through elbow exceeds the set value, a warning message appears on the display.

### Maximum permitted temperature in the slide-on duct/burn through elbow

When the set temperature value is reached, the pump is activated at maximum speed to cool the slide-on duct.

### Maximum speed SoDC pump

Maximum speed at which the pump is activated to cool the slide-on duct.

### Minimum speed SoDC pump

Minimum speed at which the pump is activated to cool the slide-on duct.

### Gain for SoDC controller Kp

Control parameter for the speed control of the pump to cool the slide-on duct.

### Reset time for SoDC controller TN

Control parameter for the speed control of the pump to cool the slide-on duct.
Parameter overview
System

**Setting - Flue gas**

- **System menu**
- **System**
- **Setting**
- **Flue gas**

**Minimum flue gas temperature**
Specifies the minimum flue gas temperature setpoint in °C.
NOTICE! When using the TI wood chip boiler, the lower range of the output increase is calculated in conjunction with the predefined flue gas control band.

**Maximum flue gas temperature**
Highest operation point of flue gas temperature for continuous operation.

**Boiler output at flue gas temperature of 20°C**
Lower point of the start ramp of boiler controller at system startup.

**100% boiler output from a flue gas temperature of**
Upper point of the start ramp of boiler controller. If the flue gas temperature reaches the value set here, the fuel output should reach 100%.

**Minimum difference between flue gas temperature and boiler temperature in HEATING**
As a condition for the “Heating” operating status, the difference between the current flue gas temperature and the current boiler temperature must at least exceed the value set here.

**Flue gas - Flue gas difference for start process**
When the boiler controller changes to “Pre-heating” status the current value of the flue gas temperature is stored. When the flue gas temperature rises by the specified value set here during “Pre-heating” or “Ignition” status, the boiler controller switches to “Heating” status.

**Safety time**
If the condition “Minimum difference between flue gas- and boiler temperature in HEATING” is not fulfilled for the set duration, the message “Safety time expired, flue gas temperature too low for too long” appears on the display.

**Flue gas temperature, below which boiler switches to OFF status**
If the flue gas temperature is below this value for the duration of the “Safety time”, the boiler switches off.

**Boiler flue gas difference for fire out**
If the current boiler temperature plus the set value is greater than the current flue gas temperature, the boiler switches off.

**Control band for flue gas temperature**
Defines the control band in °C before reaching the minimum or maximum flue gas temperature.

**Ignition power at flue gas temp.**
Specifies the flue gas temperature that must be reached, so that power can be increased. Below this temperature the boiler is limited to the ignition power. Above this temperature the maximum possible power is calculated from the control curve (“ignition power at flue gas temperature” parameter -> “100% boiler power at flue gas temperature” parameter). This should prevent the cold fire clay from heating up too quickly.
FGR characteristic progression is used to define the progression of the flue gas recirculation section. Depending on the progression selected, the FGR section is determined based on the position of the ash screw using switch points “Temp 1” and “Temp 2”.

**Temp 1**
Depending on the FGR characteristic selected, the FGR section is modified from this temperature value.

**Temp 2**
Depending on the FGR characteristic selected, the FGR section is modified from this temperature value.

**FGR characteristic progression 0:**

**FGR characteristic progression 1:**

**FGR characteristic progression 2:**

**FGR characteristic progression 3:**

**FGR characteristic progression 4:**

**Release FGR flue gas temperature**
Flue gas temperature at or above which the flue gas recirculation control system is activated. If the flue gas temperature falls to a level 3 °C below this value, then the FGR will be deactivated.

**Release FGR combustion chamber temperature**
Specifies the value in percent of the combustion chamber signal at or above which the flue gas recirculation is activated. If the combustion chamber temperature falls so low that the CCT signal falls below this value again, the flue gas recirculation will be deactivated again.

**FGR power influence**
Specifies as a percentage the influence that the current infeed level has on the FGR primary air. If this parameter is set to 100%, then the FGR Primary Air will adjust downwards proportionally to the feed level. If this parameter is set to 0%, then the FGR primary air is adjusted according to the combustion chamber signal and the calculated curve, and ignores the infeed level. At minimum output, this may result in the primary air being adjusted up to the maximum value. If the power influence is set to a negative value, this function is inverted. For negative values the FGR primary air is increased in proportion to the infeed rate.

**Max. reduction of primary air in FGR mode**
Specifies the amount by which the primary air (fresh air) can be reduced at maximum FGR primary air. Please note that the reduction is dependent on the infeed level and that the maximum reduction will not necessarily have been achieved at the point when the parameter “CCT signal for primary FGR stop” is reached. At full FGR primary air (= Maximum FGR Primary) and maximum feed level, the maximum reduction to the primary air will also be active.

**CCT signal for primary FGR stop**
Specifies the stop point for the FGR primary air as a percentage of the combustion chamber control band. The control band is defined by the parameters “0% CCT signal at CCT” and “100% CCT signal at CCT”. Because the FGR primary air is also dependent on the instantaneous feed level, it is important that the FGR primary air flap is not yet at its maximum position when this point is reached or exceeded.

**Prim. FGR decrease curve**
Specifies which curve will be used to control the FGR primary air from the stop point until the maximum combustion chamber temperature is reached.

**CCT signal for primary FGR start**
Specifies the start point for the FGR primary air as a percentage of the combustion chamber control band. The control band is defined by the parameters “0% CCT signal at CCT” and “100% CCT signal at CCT”.

---

Parameter overview

System

Froling GesmbH | A-4710 Grieskirchen, Industriestraße 12 | www.froeling.com
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prim. FGR increase curve</strong></td>
<td>Specifies which curve will be used to control the FGR primary air from the start point (“CCT signal for primary FGR start” parameter) to the stop point (“CCT signal for primary FGR stop” parameter).</td>
</tr>
<tr>
<td><strong>CCT signal for secondary FGR start</strong></td>
<td>Specifies the start point for the FGR secondary air as a percentage of the combustion chamber control band. The control band is defined by the parameters &quot;0% CCT signal at CCT&quot; and &quot;100% CCT signal at CCT&quot;.</td>
</tr>
<tr>
<td><strong>CCT signal for secondary FGR stop</strong></td>
<td>Specifies the stop point for the FGR secondary air as a percentage of the combustion chamber control band. The control band is defined by the parameters &quot;0% CCT signal at CCT&quot; and &quot;100% CCT signal at CCT&quot;. At and above this point, the maximum possible FGR secondary air has been reached.</td>
</tr>
<tr>
<td><strong>Max. reduction of secondary air in FGR mode</strong></td>
<td>Specifies the maximum reduction to the secondary air when the stop point is reached (&quot;CCT signal for secondary FGR stop&quot; parameter). This ensures that the secondary air (= fresh air) is not closed off too much by the FGR.</td>
</tr>
<tr>
<td><strong>Start of FGR control at FGR</strong></td>
<td>The FGR is only activated from this set demand. If the flue gas temperature drops by a defined value (FGR hysteresis) after the FGR is activated, the FGR is deactivated again.</td>
</tr>
<tr>
<td><strong>Influence of FGR primary air on FGR control</strong></td>
<td>This factor increases/decreases the effect of the FGR primary air flap position on the pressure setpoint in the FGR duct. It is important to note that the higher value applies (influence of FGR primary air or influence of FGR secondary air).</td>
</tr>
<tr>
<td><strong>Influence of FGR secondary air on FGR control</strong></td>
<td>This factor increases/decreases the effect of the FGR secondary air flap position on the pressure setpoint in the FGR duct. It is important to note that the higher value applies (influence of FGR primary air or influence of FGR secondary air).</td>
</tr>
<tr>
<td><strong>FGR primary air opening at 0% control</strong></td>
<td>Defines the minimum opening of the FGR primary air flap and guarantees a minimum proportion of primary air.</td>
</tr>
<tr>
<td><strong>FGR primary air opening at 100% control</strong></td>
<td>Defines the maximum opening of the FGR primary air flap and serves to limit the proportion of primary air.</td>
</tr>
<tr>
<td><strong>FGR secondary air opening at 0% control</strong></td>
<td>Defines the minimum opening of the FGR secondary air flap and guarantees a minimum proportion of secondary air.</td>
</tr>
<tr>
<td><strong>FGR secondary air opening at 100% control</strong></td>
<td>Defines the maximum opening of the FGR secondary air flap and serves to limit the proportion of secondary air.</td>
</tr>
<tr>
<td><strong>FGR secondary air opening at 0% control</strong></td>
<td>Defines the position of the FGR flap at minimum control (0% corresponds to a complete opening in the flue gas direction to the chimney).</td>
</tr>
<tr>
<td><strong>FGR flap opening at 100% control</strong></td>
<td>Defines the position of the FGR flap at maximum control. Please note that the way through the FGR duct flap is limited (rotation angle approx. 51°, corresponds to the default value of 57%)</td>
</tr>
<tr>
<td><strong>Pressure setpoint in FGR duct at 0% FGR control</strong></td>
<td>Defines the minimum pressure in the FGR duct which must be reached at minimum control.</td>
</tr>
<tr>
<td><strong>Pressure setpoint in FGR duct at 100% FGR control</strong></td>
<td>Defines the maximum pressure in the FGR duct which may not be exceeded at maximum control.</td>
</tr>
<tr>
<td><strong>FGR flap control delay time</strong></td>
<td>Defines how long the maximum permitted pressure deviation must be exceeded in order to issue a warning.</td>
</tr>
<tr>
<td><strong>Maximum permitted pressure deviation</strong></td>
<td>Defines the tolerance range for the specified pressure setpoint in the FGR duct. If the actual value remains above or below the pressure setpoint for the duration of the delay time (parameter “Delay till warning”), a warning message appears on the display.</td>
</tr>
<tr>
<td><strong>Delay till warning</strong></td>
<td>Specifies how long the maximum permitted pressure deviation must be exceeded in order to issue a warning.</td>
</tr>
<tr>
<td><strong>FGR cleaning duration</strong></td>
<td>Specifies the duration for the automatic cleaning of the FGR duct in seconds.</td>
</tr>
<tr>
<td><strong>FGR cleaning at CCT</strong></td>
<td>Specifies the combustion chamber temperature, under which the cleaning of the FGR duct is released when the boiler is shut down.</td>
</tr>
</tbody>
</table>
**Condenser**

- **Setting**
  - Flue gas
  - Condenser

### Condensation heat exchanger present
- **NO:** A calorific value heat exchanger is not in use.
- **YES:** A calorific value heat exchanger is in use.

### Condenser cleaning interval (Heating hours)
Once the specified operating hours have elapsed, in which the boiler was in “Heating” status, the calorific value heat exchanger is rinsed.

### Condenser cleaning duration
For the indicated period of time, the solenoid valve is actuated and the calorific value heat exchanger is rinsed.

### On-time of spray valve. Overall cycle 20 sec
The entire washing process is set with the “Calorific value heat exchanger cleaning duration” parameter. The cleaning time is regarded as the time in which the spray valve is active. Pause times (spray valve off) are not included in the cleaning time.

Example:
- 100% = spray valve active for the specified time
- 75% = spray valve active for 15 sec and 5 sec pause

### Reduce pump release temp. in heat-up phase by
In firewood boilers with a calorific value heat exchanger the store loading pump is enabled in the heat-up phase at a lower temperature to start flow through the heat exchanger sooner.

### Difference between return setpoint and boiler temp. in heat-up phase
During the heat-up phase, the desired return temperature setpoint is set as a difference to the set boiler temperature setpoint. The heat-up phase is the period of time between “Heating up” mode and the current boiler temperature reaching the value set under the “Boiler temperature from which all pumps are allowed to run” parameter.

### Calorific value heat exchanger cleaning possible from
Time from which the washing process can be activated.

### Calorific value heat exchanger cleaning possible until
Time to which the washing process can be activated.
E-filter

State

Filter state
Displays the current operating status of the E-filter as a numeric code. The following statuses are possible:
- Status "0": Filter deactivated
- Status "1": Filter off
- Status "2": Filter on
- Status "3": Measuring mode
- Status "4": RFI
- Status "5": Cleaning - Wait for bypass flap
- Status "6": Cleaning - Pause
- Status "7": Cleaning - Rinse
- Status "8": Cleaning - Wait, the water sensor has failed
- Status "9": Cleaning complete - Waiting for drying time
- Status "10": Filter error

Filter return signal
Shows the filter status as a numeric code. Following status values are possible:
- Status "0": No error
- Status "1": Power supply fault
- Status "2": RS485 error
- Status "3": Temperature box error
- Status "4": High voltage error
- Status "5": Wait for ready-to-measure state
- Status "6": Values critical
- Status "7": Measure
- Status "8": Measuring mode error

Water detected
Shows the status of the water sensor in the ash drawer. If the water sensor detects a water level that is too high, the E-filter is deactivated.

Time until next cleaning
Shows the remaining time (in minutes) until the next rinsing process.

E-filter service hours
Shows the operation hours since the E-filter was first activated.

Number of cleaning processes
Shows the total number of rinsing processes since the E-filter was first activated.

Output HV module 1

Output HV module 2

Output HV module 3

Output HV module 4
Displays the current output of the respective HV module as a numeric code. The following displays are possible:
- Output "0": The current output of the HV module is between 0 - 25%
- Output "1": The current output of the HV module is between 25 - 50%
- Output "2": The current output of the HV module is between 50 - 75%
- Output "3": The current output of the HV module is above 75%
### Service

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E-filter function active</strong></td>
<td>Used to activate/deactivate the electrostatic filter function. When the filter is deactivated, the bypass flap is open and the flue gas is fed directly into the chimney.</td>
</tr>
<tr>
<td><strong>Time until bypass flap is open</strong></td>
<td>Specifies the time for opening the bypass flap in seconds. The specified time must correspond at least to the actuating time of the flap drive.</td>
</tr>
<tr>
<td><strong>Close bypass flap when filter switched off</strong></td>
<td>This parameter is set to “NO” by default and should only be changed after consultation with the manufacturer.</td>
</tr>
<tr>
<td><strong>Cleaning interval</strong></td>
<td>Specifies after how many operation hours of the E-filter a cleaning cycle should be started. Depending on the raw dust content, this value is set between 4 and 8 hours.</td>
</tr>
<tr>
<td><strong>Duration of cleaning cycle</strong></td>
<td>Defines the total time for a cleaning process. Via this duration, the spray valve is periodically switched on and off.</td>
</tr>
<tr>
<td><strong>On-time of spray valve. Overall cycle 10 sec</strong></td>
<td>Defines the cycle of the spray valve, which is repeated until the total time (parameter “Duration of cleaning cycle”) has elapsed. The cycle of the spray valve is set in percentages of 10 seconds. Example: On-time of spray valve: 60%, duration of cleaning cycle: 23s; Spray valve is switched on for 6 seconds, waits for 4 seconds. This cycle is repeated until the total time is reached. (6s ON - 4s OFF - 6s ON - 4s OFF - 3s ON)</td>
</tr>
<tr>
<td><strong>Dry time</strong></td>
<td>Defines the waiting time after a cleaning cycle before the HV electrodes are activated again.</td>
</tr>
<tr>
<td><strong>Is there a siphon fitted?</strong></td>
<td>By default this parameter is set to “YES” and cleaning of the filter is performed according to the specified interval. In case of problems with the drain system (e.g. blocked duct) this parameter can be set to “NO” in the interim. The cleaning times are then adjusted so that the collection tank is not overfilled.</td>
</tr>
<tr>
<td><strong>Quick/compulsory cleaning active?</strong></td>
<td>Specifies whether the function of the quick/compulsory cleaning should be active. Quick/compulsory cleaning: If the output of the HV module is below 25% for a defined period, a quick cleaning is carried out during operation. If the output of the HV module remains below 25%, then a set waiting time is observed until the next quick cleaning.</td>
</tr>
<tr>
<td><strong>Duration of quick cleaning</strong></td>
<td>Defines the on-time of the spray valve during a quick cleaning.</td>
</tr>
<tr>
<td><strong>Minimum time between quick/compulsory cleaning</strong></td>
<td>Specifies the waiting time between two quick cleanings in minutes.</td>
</tr>
<tr>
<td><strong>Cleaning possible from</strong></td>
<td>In conjunction with the parameter “Cleaning possible till”, this defines a time window in which the automatic filter cleaning may be activated.</td>
</tr>
<tr>
<td><strong>Cleaning possible till</strong></td>
<td>In conjunction with the parameter “Cleaning possible from”, this defines a time window in which the automatic filter cleaning may be activated.</td>
</tr>
</tbody>
</table>
### IO allocation

<table>
<thead>
<tr>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>HV in 1</td>
</tr>
<tr>
<td>HV in 2</td>
</tr>
<tr>
<td>Water sensor 1</td>
</tr>
<tr>
<td>Water sensor 2</td>
</tr>
<tr>
<td>Safety switch address</td>
</tr>
<tr>
<td>HV out 1</td>
</tr>
<tr>
<td>HV out 2</td>
</tr>
<tr>
<td>Bypass flap open</td>
</tr>
<tr>
<td>Washer valve 1</td>
</tr>
<tr>
<td>Washer valve 2</td>
</tr>
</tbody>
</table>

Setting of the relevant address for the respective component for the inputs and outputs on the digital module.
**Setting - Ignition**

- **Feed time until there is a fuel quantity suitable for ignition**
  Feed time until a sufficient quantity of fuel is present on the combustion grate to carry out the ignition process.

- **Duration of pre-heating**
  Time during which only the ignition is activated. The fuel slide-in is not active for this duration.

- **Maximum ignition duration**
  Specifies how long the ignition procedure should last. "Heating" status must be reached within this time.

- **Ignition switches off above**
  Flue gas temperature at which the ignition is deactivated at the latest.

- **Infeed time without ignition**
  Specifies how long fuel is fed in onto the combustion grate before "Preheating" operating status.

- **Infeed during ignition**
  Defined fuel slide-in for the "Ignition" status duration.

- **CCT rise for heating**
  If the combustion chamber temperature rises after preheating by this value, the boiler switches to heating operating status.
Parameter overview
System

Setting - Air settings

**Minimum ID fan speed**
Lower operation point of the ID fan characteristic line.

**Minimum ID fan control**
Specifies the control voltage (0-10V) at which 0% ID fan control is emitted.

**Maximum ID fan speed**
Highest operation point of the ID fan characteristic line.

**Maximum ID fan control**
Specifies the control voltage (0-10V) at which 100% ID fan control is emitted.

**Opening of air flap at 0% control**
At 0% control of the air flap, the air flap remains open by the specified value.

**Opening of air flap at 100% control**
At 100% control of the air flap, this will open by the maximum specified value.

**Primary air opening at 0% signal**
At 0% control of the primary air flap, this will open by the specified value.

**Opening of primary air flap at 100% control**
At 100% control of the primary air flap, this will open by the maximum specified value.

**Primary air opening at minimum feed**
Specifies the primary air flap position in percent at minimum power.

**Minimum opening of air flap at full load**
In full load operation of the boiler, the air flap is opened by at least the set value.

**Opening of air flap during pre-heating**
In “Pre-heating” status, the air flap is opened to this value.

**Opening of air flap during ignition**
In “Ignition” status, the air flap is opened to this value.

**Opening of air flap during shutdown**
In “Shutdown” status, the air flap is opened to this value.

**Minimum output**

**The duration of the preparation is**
Time for the “Preparation” status.

**Secondary air opening at 0% control**
At 0% control of the secondary air flap, this will open by the specified value.

**Secondary air opening at 100% control**
At 100% control of the secondary air flap, this will open by the maximum specified value.

**Primary air delay**

**Primary air boost during heating up**

**Duration of primary air boost**

**Primary air boost during shutdown**

**ID fan startup time**
Corresponds to the minimum time of the boiler in “Preparation” status.

**Primary air when boiler off**
Specifies the primary air flap opening in percent in “Boiler off” status.

**Primary air boost for startup**
Parameter for primary air increase at the start of heating. The primary air boost remains active for the entire heating up process and after changing to “heating” status for the boost duration or until the minimum combustion chamber temperature is reached. After this time the primary air boost is reduced again.
### Start secondary air cooling at CCT signal
Specifies the start point for secondary air cooling as a percentage of the combustion chamber temperature control band. The control band is defined by the parameters "0% CCT signal at CCT" and "100% CCT signal at CCT". For the start of cooling you should ensure that the secondary air does not begin at 0, but at the current (oxygen managed) secondary air setting.

### End secondary air cooling at CCT signal
Specifies the end point for secondary air cooling as a percentage of the combustion chamber temperature control band. The control band is defined by the parameters "0% CCT signal at CCT" and "100% CCT signal at CCT". At this value the secondary air flap has reached the maximum permitted opening.

### Start of output reduction at CCT signal
Description should also be changed in the SPS operating instructions:
Specifies the start point for power reduction as a percentage of the combustion chamber temperature control band. The control band is defined by the parameters "0% CCT signal at CCT" and "100% CCT signal at CCT". If the combustion chamber temperature signal exceeds this value, the fuel feed-in and the primary air are reduced. Both have the minimum value at 100% combustion chamber temperature signal.

### Boiler underpressure setpoint
Desired underpressure which is to be maintained during the operation of the boiler.

### Black underpressure transmitter installed (Type: 401.93000)

### Minimum underpressure
If this underpressure is not reached within a defined period of time, a warning is issued.

### Time until error for MIN under-pressure in combustion chamber
If the specified under-pressure is not reached after this time, a fault is issued.

### Max. power reduction through under pressure control
Maximum power reduction when setpoint underpressure not reached.
### Setting - Fuel slide-in

<table>
<thead>
<tr>
<th>Parameter Overview</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum value for automatic max. fuel feed-in</strong></td>
<td>Upper limit for the automatic fuel feed-in.</td>
</tr>
<tr>
<td><strong>Minimum value for automatic max. fuel feed-in</strong></td>
<td>Lower limit for the automatic fuel feed-in.</td>
</tr>
<tr>
<td><strong>Minimum power</strong></td>
<td>Minimum infeed as a percentage of the maximum infeed (“maximum infeed” parameter). Lowest possible power.</td>
</tr>
<tr>
<td><strong>Differential pressure setpoint at minimum power</strong></td>
<td>Pressure setpoint specification for the differential pressure above the grate at minimum boiler power.</td>
</tr>
<tr>
<td><strong>Differential pressure setpoint at 100% power</strong></td>
<td>Pressure setpoint specification for the differential pressure above the grate at maximum boiler power.</td>
</tr>
<tr>
<td><strong>Infeed calculation differential pressure Kp</strong></td>
<td>Proportional value of the PI controller for the infeed calculation.</td>
</tr>
<tr>
<td><strong>Infeed calculation differential pressure Tn</strong></td>
<td>Reset time of the PI controller for the infeed calculation.</td>
</tr>
<tr>
<td><strong>Start value for slide-in control</strong></td>
<td>The boiler starts with this value for the maximum fuel feed-in. Caution: Via the parameter “Monitoring time for start value tracking” and “Delta +/- for start value tracking” the start value for the slide-in control during operation is adjusted.</td>
</tr>
<tr>
<td><strong>Monitoring time for start value tracking</strong></td>
<td>The automatic fuel feed-in is checked constantly. If this percentage value changes within the monitoring time to less than the parameter “Delta +/- for start value tracking”, the start value is set to the current fuel feed-in.</td>
</tr>
<tr>
<td><strong>Delta +/- for start value tracking</strong></td>
<td>In conjunction with the parameter “Monitoring time for start value tracking”, the start value for the slide-in control is automatically adjusted, as required.</td>
</tr>
<tr>
<td><strong>Maximum infeed</strong></td>
<td>Maximum loading rate of feed screw.</td>
</tr>
<tr>
<td><strong>Minimum infeed</strong></td>
<td>Minimum feed rate of feed screw.</td>
</tr>
<tr>
<td><strong>Feed time of feed screw is</strong></td>
<td>The feed time in seconds, during which the feed screw is active after the pre-run time of the stoker screw.</td>
</tr>
<tr>
<td><strong>Stoker pre-run</strong></td>
<td>Time that the stoker runs before the feed screw is activated.</td>
</tr>
<tr>
<td><strong>The minimum feed time of the feed screw is</strong></td>
<td>Minimum time that the feed screw is on.</td>
</tr>
<tr>
<td><strong>Delivery time feed screw</strong></td>
<td>Time for calculation of feed.</td>
</tr>
<tr>
<td><strong>Time feed screw is on until stoker screw</strong></td>
<td>Runtime ratio between feed screw and stoker screw.</td>
</tr>
<tr>
<td><strong>The time until the stoker is full is</strong></td>
<td>Total time that the feed screw is on, until the fuel falls onto the grate (= stoker is full).</td>
</tr>
<tr>
<td><strong>The time until the stoker is empty is</strong></td>
<td>Theoretical runtime of the feed screw until there is no more fuel in the stoker.</td>
</tr>
<tr>
<td><strong>Rotary valve run-on</strong></td>
<td><strong>Prerequisite:</strong> Rotary valve with own drive installed Duration that the rotary valve continues to run after the feed screw has stopped.</td>
</tr>
<tr>
<td><strong>Switch-on delay feed screw light barrier</strong></td>
<td><strong>Prerequisite:</strong> Level sensor installed between feed and stoker augers The time for which the light barrier must consistently recognise material to activate material recognition in the drop box.</td>
</tr>
</tbody>
</table>
### Switch-off delay feed screw light barrier

**Prerequisite:** Level sensor installed between feed and stoker augers

The time for which the light barrier must consistently recognise no material to deactivate material recognition in the drop box.

### Switch-on delay of delivery screw(s) light barrier(s)

**Prerequisite:** Delivery screw installed or intermediate screw installed

The time for which the light barrier must consistently recognise material to activate material recognition in the delivery screw.

### Switch-on delay of delivery screw(s) light barrier(s)

**Prerequisite:** Delivery screw installed or intermediate screw installed

The time for which the light barrier must consistently recognise no material to deactivate material recognition in the delivery screw.

### Error of light barrier(s) is delayed for

**Prerequisite:** Overfilling safety device installed for rotary valve or level sensor installed between feed and stoker augers

Time delay until an error in the material recognition is tripped.

### Max. counter limit for troubleshooting of rotary valve overcurrent is

**Prerequisite:** Rotary valve with own drive installed

Number of troubleshooting attempts on the rotary valve if the overcurrent sensor of the rotary valve activates.

### During troubleshooting of stoker, it turns forwards for

Duration, how long should the stoker turn forwards during troubleshooting of stoker.

### During troubleshooting of stoker, it turns backwards for

Duration, how long should the stoker turn backwards during troubleshooting of stoker.

### During troubleshooting of feed screw, it turns forwards for

Duration, how long should the feed screw turn forwards during troubleshooting.

### During troubleshooting of feed screw, it turns backwards for

Duration, how long should the feed screw turn backwards during troubleshooting.

### During troubleshooting of rotary valve, it turns forwards for

**Prerequisite:** Rotary valve with own drive installed

Duration, how long should the rotary valve turn backwards during troubleshooting.

### A rotary valve motor protection switch error is delayed for

**Prerequisite:** Rotary valve with own drive installed

Time delay of an error message for the rotary valve motor protection switch.

### The back-burn flap opens after a maximum of

**Prerequisite:** Back-burn flap installed

Maximum time the burn back flap has turned from the closed to the open position.

### The back-burn flap closes after a maximum of

**Prerequisite:** Back-burn flap installed

Maximum time the burn back flap must be closed.

### Nominal current for stoker screw (MSS*2)

Setting the nominal current of the stoker screw according to the identification plate on the motor.

### Nominal current for rotary valve

**Prerequisite:** Rotary valve with own drive installed

Setting the nominal current of the rotary valve according to the identification plate on the motor.

### Nominal current for feed screw

Setting the nominal current of the feed screw according to the identification plate on the motor.

### Min. current monitoring with stoker

- **YES:** A failure of measured phase is detected.

### Min. current monitoring with feed screw

- **YES:** A failure of measured phase is detected.

### Min. current monitoring with rotary valve

- **YES:** A failure of measured phase is detected.

### Start delay of light barrier at sliding floor

**Prerequisite:** Feed system, sliding floor available

If the light scanner does not detect any material within this time, the sliding floor is switched on.

### Release delay of light barrier at sliding floor

**Prerequisite:** Feed system, sliding floor available

If the light scanner detects material within this time, the sliding floor is switched on.
### Cycles of sliding floor after

**Prerequisite:** Feed system, sliding floor available

If the transverse conveyor screw runs for this time without the sliding floor being requested, the sliding floor is activated for a set time ("Duration of cycles of sliding floor after" parameter).

### Duration of cycles of sliding floor after

**Prerequisite:** Feed system, sliding floor available

Specifies how long the sliding floor is activated for in override.

### maximum numbers of cycle for sliding floor

**Prerequisite:** Feed system, sliding floor available

Specifies how often the sliding floor can be activated in succession via the override.
Clean after how many hours heating?
If the boiler has passed the set time in “Heating” status, the boiler shuts down for a cleaning cycle.

During heating-cleaning reduce output for
In “Heating - Cleaning” status, before the combustion grate is cleaned, the output of the boiler is reduced to minimise the bed of embers.

During heating-cleaning release output after
After cleaning the combustion chamber grate, the bed of embers will be formed again in the specified time.

Tilt the grate how often during heating-cleaning?
Defines the number of times the combustion chamber grate is tipped during “Heating - Cleaning” status.

Slide-in during heating-cleaning
During the “Heating - Cleaning” status the fuel slide-in is limited to the specified value.

Primary air during heating-cleaning (absolute)
During the “Heating - Cleaning” status the primary air flap is opened to the specified value.

During heating - cleaning the grate should stay open for
If the combustion grate is tipped in “Heating - Cleaning” status, it will remain open for the specified time in order to allow the burned fuel to slide down the ash chute.

Clean after how many shutdowns
This parameter defines the number of shutdowns after which the cleaning cycle is carried out.

WOS runs every
When the delivery screw runtimes reach the specified value, the WOS drive is activated.

WOS runtime
Time which the heat exchanger cleaning system is activated.

Minimum duration of blower fan run-on I (for residual O2)
Minimum duration of “FD fan run-on I” status. If the criteria “Current residual oxygen content” < “Residual oxygen content, above which fire is out” has already been fulfilled, the operating status is not cancelled early. The maximum duration of the operating status is 1 hour.

Minimum duration of blower fan run-on II (for flue gas temperature)
Minimum duration of “FD fan run-on II” status. If the criteria “Current flue gas temperature” < “Flue gas temperature, below which boiler switches to OFF status” has already been fulfilled, the operating status is not cancelled early.

Cycle of ash screw

Ash screw runtime
Time which the ash screw drive is activated.

First start of cleaning

Second start of cleaning
Setting - WOS / Cleaning

Clean after how many hours heating?
If the boiler has passed the set time in "Heating" status, the boiler shuts down for a cleaning cycle.

Tilt the grate how often during cleaning?
Defines the number of times the combustion chamber grate is tipped during "Cleaning" status.

Permitted start processes with blocked ash screw
Defines the number of boiler start processes that can be carried while the ash screw is blocked. Once the specified number has been reached, no further start process is permitted.

WOS start time
Time from which the heat exchanger cleaning system can be activated.

WOS stop time
Time to which the heat exchanger cleaning system can be activated.

WOS runs every
When the delivery screw runtimes reach the specified value, the WOS drive is activated.

WOS runtime
Time which the heat exchanger cleaning system is activated.

Minimum duration shutdown
Minimum duration of "Shutdown wait" status, in which the remaining fuel is burned on the combustion grate.

Ash screw interval
Time until the ash screw is activated.

Ash screw runtime
Time which the ash screw drive is activated.

Cleaning after standby
- YES: When the boiler switches off, the combustion chamber grate is only tipped and cleaned after the next start command. The remaining bed of embers cools down and when fully cooled falls into the ash screw.
- NO: In "Cleaning" operating status the combustion grate is tipped and cleaned.
### Underpressure in the boiler at maximum output
At maximum boiler output the specified underpressure has to be kept.

### Boiler underpressure setpoint
Desired underpressure which is to be maintained during the operation of the boiler.

### Underpressure MIN control variable
Adjustable parameters for the underpressure control.

### Underpressure at minimum output
At minimum boiler output the specified underpressure must be kept.

### Control pressure during preparation (seal control)
In “Preparation” status, the minimum underpressure specified must be reached.

### Control pressure tolerance during preparation (seal control)
In “Preparation” status, a maximum deviation for the parameter “Control pressure during preparation (seal control)” can be reached.

### Underpressure during pre-heating
In “Pre-heating” status, the specified underpressure is required as a minimum.

### Underpressure during shutdown
In “Shutdown” status, the specified underpressure is required as a minimum.

### Black underpressure transmitter installed (Type: 401.93000)

### Minimum combustion chamber temperature
Defines the minimum combustion chamber temperature in heating status. In conjunction with the parameters “Power increase from __ K above minimum CCT” and “Min. power at minimum combustion chamber temperature and flue gas temperature” the range of power increase due to the low combustion chamber temperature is calculated.

### Combustion chamber temperature for Heating
Combustion chamber temperature which must be reached during the heating process of the boiler to change to “Heating” status.

### Start of combustion chamber temperature control
Threshold value for activating the combustion chamber temperature regulator.

### Width of the cc temp. control band
Temperature range within which the combustion chamber temperature is to be regulated.

### Maximum combustion chamber temperature
Maximum combustion chamber temperature which can be reached in the “Heating” status.

### NO feed if temp over
If the combustion chamber temperature in “Heating” status exceeds the specified value, the fuel slide-in is stopped.

### Power increase from __° above minimum CCT
In conjunction with the parameter “Minimum combustion chamber temperature”, this defines the control band, within which the minimum output of the boiler is increased.

### 0% CCT signal at CCT
Together with the parameter “100% CCT signal at CCT”, this defines the combustion chamber temperature signal.

### 100% CCT signal at CCT
Together with the parameter “0% CCT signal at CCT”, this defines the combustion chamber temperature signal.

### Minimum output

### Maximum boost of output to
Maximum opening of the primary air flap at minimum boiler output.

### Start of combustion chamber cooling at cc temp signal
When the combustion chamber temperature signal reaches the specified value, the combustion chamber cooling is started.
### End of combustion chamber cooling at cc temp signal
When the combustion chamber temperature signal reaches the specified value, the combustion chamber cooling stops.

### Start of slide-in reduction from cc temp signal
When the combustion chamber temperature signal reaches the specified value, the fuel slide-in is reduced.

### Current cc temp. signal
Display of the current combustion chamber temperature signal.

### CC cooling through secondary air
Display of the current combustion chamber cooling by the secondary air.

### Slide-in is limited to a maximum of
Display of the current feed-in limit during combustion chamber cooling.

### Output boost using combustion chamber control
Display of the current power increase rate due to combustion chamber regulation.
Setting - Lambda values

Heating up time for lambda probe
Time for the heating up cycle of the lambda probe.

Residual oxygen content setpoint
Residual oxygen content which is regulated during “Heating” status.

Maximum deviation of residual O2 from setpoint
Within this tolerance range, with reference to the residual oxygen content setpoint, the residual oxygen controller does not activate.

O2 setpoint increase for partial load
In partial load operation of the boiler, the residual oxygen content to be reached is increased by the specified value.

No feed when residual O2 below
If the current residual oxygen content falls below the set value, the fuel slide-in stops.

Maximum feed correction by O2 controller
Maximum correction factor, by which the residual oxygen controller can change the infeed.

Residual oxygen content, above which fire is out
If the current residual oxygen content in “Heating” status exceeds the specified value, the safety time begins to run.

O2 Controller max
Adjustable parameters for the residual oxygen controller.
NOTICE! Factory setting - do not change!

Slide-in control
Adjustable parameters for the fuel slide-in controller.
NOTICE! Factory setting - do not change!

Start value of the O2 regulator
Adjustable parameters for the fuel slide-in controller.
NOTICE! Factory setting - do not change!

Residual oxygen above which the lambda probe is allowed to switch off
If the boiler switches to “Boiler off” or “Off” mode, the lambda probe heating remains active for at least 1 hour, up to a maximum of 24 hours. If the residual oxygen content exceeds the value set here, the lambda probe heating is switched off.
### Setting - Lambda values - LSM11 Lambda probe

**Residual oxygen content**
Displays the current residual oxygen content.

**Lambda probe voltage measured**
Display of the current measured Lambda probe voltage.

**Lambda probe correction value**

### Setting - Lambda values - Broadband probe

**Residual oxygen content**
Displays the current residual oxygen content.

**Broadband probe type**
(1.. Bosch / 2.. NTK)
(3.. LSM11 input)
Setting the type of broadband probe used.

**Lambda probe heating**
- A 0: Automatic, Off
- A 1: Automatic, On
- 1: Manual, On
- 0: Manual, Off

**Broadband probe calibration (probe must be at 21% O2)**
- YES: After activation of the lambda probe heating, the broadband probe can be calibrated.

**NOTICE!** The broadband probe must be at 21% oxygen (air)!

**Broadband probe heating current**
Display of the measured broadband probe heating current.

**Broadband probe heating voltage**
Display of the measured broadband probe heating voltage.

**Broadband probe Nernst voltage**
Display of the measured broadband probe Nernst voltage.

**Broadband probe pump current**
Display of the measured broadband probe pump current.

**Broadband probe internal resistance**
Display of the measured broadband probe internal resistance.
**Setting - General settings**

- **Modem installed**
  - NO: The boiler does not have a modem for data transfer installed.
  - YES: The boiler has a modem for data transfer installed.

- **Memory cycle of data logger**
  If the boiler is equipped with a data logger the most important boiler data is stored on a SD card. This parameter specifies at what intervals the recording should be started.

- **Output warnings through fault message relays**
  - NO: When there is an “error” or “alarm” the common fault relay closes.
  - YES: In addition to an “error” or “alarm”, the common fault relay closes when a “warning” is present on the boiler.

- **Display temperature in Fahrenheit**
  - NO: Displayed temperature values and settings are shown in °C.
  - YES: Displayed temperature values and settings are shown in °F.

- **Always log data in °C**
  - YES: In conjunction with a data logger, all temperature values are saved in °C.
  - NO: In conjunction with a data logger, all temperature values are saved in °F.

- **Send a line break when ASCII data output on COM2**
  - NO: When a new data set is issued it will be added to the previous one.
  - YES: A line break for better visualisation is sent between the individual data sets.

- **EEPROM reset**
  - YES: All boiler settings and system configurations are deleted. The boiler is only functional again once it has been recommissioned by Fröling customer services or authorized installer.

- **Adopt specified material values**
  YES: The preset boiler parameters for the chosen fuel selection are adopted. When the process is completed the parameter changes back to “NO”.

- **Adopt standard settings (all values are reset)**
  - YES: Adopting standard factory settings This resets all parameters! Once the settings have been applied, the parameter automatically switches to “NO” and the boiler must be reset; otherwise, boiler functioning is no longer guaranteed.

- **Source for ext. power demand (0 - off, 1 - 0-10V, 2 - Modbus)**

- **Invert ext. power demand via analogue input**

- **Input external power demand**

- **Current external power demand**

- **EEPROM reset**
  - YES: All boiler settings and system configurations are deleted. The boiler is only functional again once it has been recommissioned by Fröling customer services or authorized installer.
**MODBUS settings**

Setting

- **General settings**
- **MODBUS settings**

**COM 2 is used as a MODBUS interface**

- **NO:** The COM 2 interface sends the most important boiler values every second.
- **YES:** The COM 2 interface can be used to connect a MODBUS (RTU/ASCII)

**MODBUS protocol (1 – RTU / 2 – ASCII)**

**Use MODBUS protocol 2014?**

**MODBUS address**
5.14.2 System - Current values

Display of the current value for the relevant parameter. The parameters displayed depend on the boiler configuration!

**Current status runtime**

| : |

**Software version**

| : |

**Service hours**

Display of the current number of operation hours of the respective unit and respective components. The parameters displayed depend on the boiler configuration!

**Hours since last maintenance**

| : |

**Delivery screw service hours**
In the “Sensors and pumps” menu, all sensor inputs and pump outputs available in the hydraulic system can be allocated. The number of parameters depends on the configuration.

<table>
<thead>
<tr>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Which sensor is used for buffer tank top</td>
</tr>
<tr>
<td>Which sensor is used for bottom buffer tank</td>
</tr>
<tr>
<td>Which pump is used for the buffer tank</td>
</tr>
</tbody>
</table>

Service manual Lambdatronic H 3200 for wood chip boiler | B1480217_en 105
5.14.4 System - Display operating rights

In this menu the operating rights for the individual room consoles are allocated. If access from a room console to a heating system component is permitted, then the corresponding parameter must be set to "YES". The number of menus as well as the parameter entries depend on the system configuration!

**NOTICE!** The operating rights of the room consoles should be allocated from the boiler console, as unrestricted access is only possible here.

"Touch display with address 1 – 7" and "Button display with address 1 – 7"

**Heating system:**
- Allow access to heating circuit 01?
- Allow access to heating circuit 02?
- Allow access to heating circuit 18?

**DHW tank system:**
- Allow access to DHW tank 01?
- Allow access to DHW tank 02?
- Allow access to DHW tank 08?

**Buffer tank system:**
- Allow access to buffer tank 01?
- Allow access to buffer tank 04?

**Solar panel system:**
- Allow access to solar 01?

**Heating system:**
- Additional freely programmable differential controller installed
- Network pump installed
- Circulation pump installed
- Is any secondary boiler installed? (oil, gas, wood...)
- Feeder pump House 1 installed
- Feeder pump House 4 installed

"In the cascade, this boiler is the MASTER"
For connection via the froeling-connect.com online platform using a touch display, the issue of a password is required.

**NOTICE! The same password can be assigned for each touch display!**

<table>
<thead>
<tr>
<th>Password for boiler display</th>
</tr>
</thead>
<tbody>
<tr>
<td>Password for Touch display with address 1</td>
</tr>
<tr>
<td>:</td>
</tr>
<tr>
<td>Password for touch display with address 7</td>
</tr>
</tbody>
</table>
5.14.5 System - Display allocation

Room temperature sensor correction:
If a deviation of the room temperature is determined from the evaluated value to the displayed value, the evaluation of the room temperature sensor can be adjusted with the following parameters.

- Deviation of room sensor from Touch display with address 1
- Deviation of room sensor from Touch display with address 7
- Deviation of room sensor from button display with address 1
- Deviation of room sensor from button display with address 7

DHW tank system:
To assign a room console to a DHW tank, the respective DHW tank number with its address must set on the room console. The parameters are set to “none” at the factory!

- Touch display with address 1 is allocated to the following DHW tank:
- Touch display with address 7 is allocated to the following DHW tank:
- Button display with address 1 is allocated to the following DHW tank:
- Button display with address 7 is allocated to the following DHW tank:

Heating system:
To assign a room console to a heating circuit, the respective heating circuit number with its address must set on the room console. The parameters are set to “none” at the factory!

- Touch display with address 1 is allocated to the following heating circuit:
- Touch display with address 7 is allocated to the following heating circuit:
- Button display with address 1 is allocated to the following heating circuit:
- Button display with address 7 is allocated to the following heating circuit:
5.14.6 System - System selection

System menu → System → System selection
5.15 Diagnostics

5.15.1 Diagnostics - Error display

Display of the current fault messages. In addition, you can also invoke time information here, such as when the fault occurred, when the fault was acknowledged and when the fault was cleared.

5.15.2 Diagnostics - Error history

Up to 50 fault indication entries are stored in the error history. A fault can consist of up to 3 fault indication entries. You can determine what type of fault message it is, when the fault occurred (appeared), when the fault was acknowledged and when the fault was eliminated (cleared). If all 50 fault indication entries are in use and there is another fault indication entry, the oldest entry will be deleted to make room for the current one.

5.15.3 Diagnostics - Clear error history

The entire error history can be deleted using this function. From this point onwards the error history is populated with fault indication entries which have occurred since clearing the error history.
5.16 Display settings

5.16.1 Display settings - General

System menu → Display settings → General

**Adopt standard settings (all values are reset!)**

- **YES:** Adopting standard factory settings. This resets all parameters! Once the settings have been applied, the parameter automatically switches to "NO" and the boiler must be reset; otherwise, boiler functioning is no longer guaranteed.

**Room temperature**

Shows the current room temperature.

**Brightness**

Display of the light sensor's evaluation of the current brightness in the room for adjusting the backlight.

**maximum backlight**

The brighter it is in the room, the more the background of the touch display is illuminated. This is where you can limit the maximum backlight.

**minimum backlight**

The darker it is in the room, the less the background of the touch display is illuminated. This is where you can set the minimum backlight.

**Network settings**

Display settings → General → Network settings

**Obtain IP address automatically**

- **On:** IP address of touch control is automatically obtained from the network
- **Off:** IP address, subnet mask, standard gateway and DNS server can be manually set.

**Subnet mask**

**Default gateway**

**DNS server**

**Delay time for screen saver (0 deactivates the screensaver)**

If the screen of the touch display is not touched within the set time, the screensaver will activate and the display will go dark. To disable the screensaver, set the delay time to "0".

**Modul address**

This is where you can change the module address if it is incorrectly set.

Module address 0: Boiler console
Module address 1-7: respective RBG Touch

**NOTICE!** Once you have changed the module address, you will need to restart the boiler controller! (switch main switch on boiler off and on).
### 5.16.2 Display settings - Basic display

On the basic display, up to six different information displays can be freely selected. The selection depends on the system configuration.

- See "Selecting the information displays" [page 27]

### 5.16.3 Display settings - Date / Time

- **Date**
  - Display and setting of current date.
- **Time**
  - Display and setting the current time.

### 5.16.4 Display settings - Software update / Service

- **Calibrate screen**
  - Calibrating the touchscreen
- **Reload data**
  - Restore control device to factory settings (restart is carried out)
- **Restart control**
  - Updating the software of the touch control
**6 Troubleshooting**

The term "fault" is a collective term for warnings, errors and alarms. The boiler reacts differently to the three types of message:

<table>
<thead>
<tr>
<th><strong>WARNING</strong></th>
<th>In case of warnings the status LED flashes orange and the boiler initially continues controlled operation.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ERROR</strong></td>
<td>When there is an error, the status LED flashes red, the boiler follows the shutdown procedure and remains in “Fault” status until the problem is resolved.</td>
</tr>
<tr>
<td><strong>ALARM</strong></td>
<td>An alarm triggers a system emergency stop. The status LED flashes red, the boiler switches off immediately and the heating circuit controller and pumps remain active.</td>
</tr>
</tbody>
</table>

A window with the corresponding fault text will also appear. Pressing the Cancel icon takes you back to the basic display. If the quick select icon and the warning triangle flash alternately, there is still a fault. The “Error display” button will now appear in the quick menu.

**6.1 Procedure for fault messages**

If you open the window with the respective fault text, the right arrow will take you to possible causes of the fault.
Tapping “Solution” will also display action to be taken to resolve the problem. If there are several options available, these will be listed one below the other.

Once the fault has been resolved, tap the Cancel icon to return to the basic display.
7 FAQ

7.1 Calibrate the broadband probe

The type of probe installed must be determined before starting calibration. To this end, coloured stickers (BOSCH = blue, NTK= yellow) are affixed to the connection cable of the probe, as well as to each end of the extension cable.

<table>
<thead>
<tr>
<th>BOSCH broadband probe</th>
<th>NTK broadband probe</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="BOSCH broadband probe" /></td>
<td><img src="image2" alt="NTK broadband probe" /></td>
</tr>
</tbody>
</table>

Once the type of probe has been determined, the parameters need to be adjusted accordingly in the controller.

- Set the type of probe used
  - BOSCH = 1, NTK = 2

For boilers with manual loading:
- Open the insulated door
  - Before starting calibration, the insulated door must be open for at least 3 - 4 minutes so that the probe is warm enough and the boiler is sufficiently ventilated

For boilers with automatic loading:
- Boiler must be switched off
  - Status "Boiler OFF" or "Standby"
- Set the “Lambda probe heating” parameter to “1”
  - Heat broadband probe for at least 2 minutes

Calibrate probe:

NOTICE! The broadband probe must be at 21% oxygen (air)!
- Go to parameter “Broadband probe calibration”
- Set parameter to “YES” and press the enter key
  - Automatic calibration of the broadband probe begins

Once calibration is complete the parameter is automatically set to “NO” and the broadband probe is ready for use.
7.2 PWM / 0 - 10V settings

- **Pump without control line**
  Set when a standard pump a switching valve with RC element is run at the respective output. When using a switching valve, set the minimum speed of the output to 100%. When a pump is used, it is controlled at the 230V output using pulse packets.

- **Field pump / PDM**
  There is a permanent power supply of 230V at the output for the high efficiency pump. The pump is controlled using pulse duration modulation at the respective PWM output.

- **Solar pump / PDM**
  Here again, the pump is controlled by means of pulse duration modulation at the respective PDM output. In this case, however, the characteristic line is inverted and can only be used for specially marked high efficiency solar pumps.

- **PDM field pump + valve**
  The signal for the field pump is emitted at the PDM output. If the signal exceeds 2%, the 230V output is switched on. If the signal is below 2% for more than 4 minutes, the output is switched off again.

- **PDM sol. pump + valve**
  The signal for specially marked high efficiency solar pumps is emitted at the PDM output. If the signal exceeds 2%, the 230V output is switched on. If the signal is below 2% for more than 4 minutes, the output is switched off again.

- **Field pump / 0 – 10 V**
- **Solar pump / 0 – 10V**
- **Field pump 0–10V +valve**
- **Sol. pump 0–10V +valve**
  The same functions that apply with PDM apply to the parameter values with 0-10V. The only difference is that instead of pulse duration modulation, a 0-10V signal is used to control the pump.

- **Isolating valve**
  When set to “Isolating valve” the output is activated either with 0% or 100%. This setting value is only available in the “Water” or “Boiler 2” menu.
7.3 Software Update Lambdatronic 3200

The following description shows the software update process for systems with Lambdatronic 3200 and a touch control in the system environment (also applies to systems with button boiler console and touch room console). The Froling Flash Update Wizard (core module) as well as a USB storage device is necessary to perform the software update. The procedure for establishing a connection and any necessary bootloader update is described in the documentation of the Flash Update Wizard.

**Overview of main steps during a software update**

Perform flash update - but do not close the Wizard

1. ![Lambdatronic Service](image)

See "Carrying out a software update on the boiler controller" [page 118]

Perform software update of all touch controls

2. ![Touch controls](image)

See "Carrying out a software update on the touch control" [page 120]
7.3.1 Carrying out a software update on the boiler controller

Selecting a Flash file

Once the connection has been established, the main window displays the update files which can be installed:

- The "Version installed" field displays the Flash version which is currently installed on the boiler controller
- There is a drop-down list next to the "Update to:" field which shows the Flash files available in the standard folder

If the Flash file is located in the standard folder:
- Select the required Flash file from the drop-down list

If the Flash file is not located in the standard folder:
- Click on the "Find" button in the "FLASH" section
  - A window is displayed where you can search for the Flash file
- Navigate to the folder where the file is saved
- Select the Flash (*.s19) file and click on the "Open" button
Starting the Flash update

After selected the desired Flash file, it will be displayed next to the "Update to:" field:

- Click on the "Next" button
  - The update process will now start and a progress bar displays the current status

When the flash update is successfully transferred to the boiler controller, the following window appears:

- NOTICE! Do not close the update at this time and do not disconnect the boiler controller!
7.3.2 Carrying out a software update on the touch control

NOTICE! If several touch controls are installed, we recommend the use of several USB sticks and to perform the updates in parallel!

- Insert the USB stick with the necessary data (linux.bin; rootfs.img; update; froresetdemo.inc or frorestart.inc) into the USB port
  ➔ System message for restart is displayed
- Tap “OK” to carry out a restart of the touch control
  ➔ After the restart, the update process will begin automatically

Once the update is complete, a message will appear that you can remove the stick
- Remove the USB stick and close the cover flap (only with boiler console)
- Tap the touch screen

After restarting the display will start calibrating. Once the calibration is complete, it will restart again to finish. The touch control software is now up to date.
- Perform software updates to any other touch controls installed
7.3.3 Finishing a software update

When the software update has been performed on all touch controls, the Flash Update Wizard must be ended correctly.

End flash update

☐ Click on the "Next" button
  ➔ The completion window appears

☐ Clicking on "Close" closes the Flash Update Wizard and restarts the boiler controller
  ➔ After restarting the boiler controller, check whether all touch controls have started up correctly

NOTICE! If not all touch controls connect to the boiler control, a restart of the entire system (main switch OFF/ON) is necessary!