VIADRUS K 5
Manual for boiler operation and installation
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Dear customer,
We thank you that you have bought a VIADRUS K5 boiler, thus having shown your confidence in VIADRUS brand. In order to accustom to correct manipulation with your new product, before installation and commissioning, please carefully acquaintance with the instruction manual (mainly, chapter 8 – Operation with the stove by a user, and chapter No. 10 – Important warnings). Please observe the below mentioned information, and mainly perform specified annual checks by a professional company, in order to ensure a long-term trouble-free operation to your and our satisfaction.

1 Produced versions of boilers

Please specify in your order a specification code for ordering:

| X₁ | Heat exchanger: D: silumin DEJATECH |
| X₂ | Water heating: 4: with an inbuilt heater of HW |
| X₃ | Electric equipment: L: Siemens |
| X₄ | Power: 20: 20kW |
| X₅ | Fuel: Z: natural gas P: propane |
| X₆ | Color of the cover: W: white |

The boiler is standardly set on fuel: natural gas. Only a contractual service organization may perform a reconstruction of the boiler VIADRUS K5 from natural gas to propane and contrariwise. The fume-extraction system from company ALMEVA is approved for the boiler. In case of using of the fume-extraction system for the condensing boilers of other manufacturers it is necessary to use a system of the same parameters as for the approved type of the fume-extraction system.

2 Usage and advantages of the boiler

The condensing boiler VIADRUS K5 is determined for combustion of low-pressured natural gas. The size of the condensing boiler is suitable both for heating single-family houses, recreation facilities, and for reconstruction of heat sources in separate accommodation units.

Heating power of the condensing boiler is 4 – 20 kW.

Effectiveness of the boiler drum at the temperature gradient 50/30 °C is up to 109 %, and that is in dependence on the required power.

Advantages of the boiler:

- Low gas consumption.
- High effectiveness of combustion.
- Smooth power modulation.
- Simple manipulation and maintenance
- Integrated reservoir for HW heating with capacity of 60 l.
- Reliability of regulation and safety elements.
- Low weight.
- Automatic detection of faults.
- Independent time program, including for HW.
- Equithermal regulation of the boiler.
## Technical data

### Tab. № 1  Sizes, operating temperature and electrical parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fuel type</strong></td>
<td></td>
<td>Natural gas</td>
</tr>
<tr>
<td><strong>Consumer category</strong></td>
<td></td>
<td>I₂H</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>[kg]</td>
<td>85</td>
</tr>
<tr>
<td><strong>Water content</strong></td>
<td>[l]</td>
<td>9</td>
</tr>
<tr>
<td><strong>Boiler sizes - width/depth/height</strong></td>
<td>[mm]</td>
<td>680/505/950</td>
</tr>
<tr>
<td><strong>Ø of connection of combustion air</strong></td>
<td>[mm]</td>
<td>80 divided, 100 concentrated</td>
</tr>
<tr>
<td><strong>Ø of chimney throat</strong></td>
<td>[mm]</td>
<td>80 divided, 60 concentrated</td>
</tr>
<tr>
<td><strong>Ø of connection of coaxial fume-extraction system to the boiler</strong></td>
<td>[mm]</td>
<td>60 / 100</td>
</tr>
<tr>
<td><strong>Ø of connection of the divided fume-extraction system to the boiler</strong></td>
<td>[mm]</td>
<td>suction 80, flue gases 80</td>
</tr>
<tr>
<td><strong>Maximum operation water overpressure</strong></td>
<td>[kPa]/[bar]</td>
<td>250 / 2.5</td>
</tr>
<tr>
<td><strong>Testing water overpressure</strong></td>
<td>[kPa]/[bar]</td>
<td>600 / 6</td>
</tr>
<tr>
<td><strong>Min. water pressure in the Central Heating system (a value of the air-pressure switch)</strong></td>
<td>[kPa]/[bar]</td>
<td>80 / 0.8 (appr. 60 / 0.6)</td>
</tr>
<tr>
<td><strong>Expansion tank size</strong></td>
<td>[L]</td>
<td>10</td>
</tr>
<tr>
<td><strong>Loss coefficient</strong></td>
<td></td>
<td>11.37</td>
</tr>
<tr>
<td><strong>The highest admissible operation temperature</strong></td>
<td>[°C]</td>
<td>85</td>
</tr>
<tr>
<td><strong>The range of setting of hot water temperature for the consumption of hot water</strong></td>
<td>[°C]</td>
<td>8 - 65</td>
</tr>
<tr>
<td><strong>Connecting overpressure of fuel G20</strong></td>
<td>[mbar]</td>
<td>20</td>
</tr>
<tr>
<td><strong>Noise level</strong></td>
<td>[dB]</td>
<td>&lt; 55</td>
</tr>
<tr>
<td><strong>Boiler connection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- heating water output</td>
<td>[Js]</td>
<td>3/4*</td>
</tr>
<tr>
<td>- return heating water input</td>
<td>[Js]</td>
<td>3/4*</td>
</tr>
<tr>
<td>- input of cold water into the heater (CW)</td>
<td>[Js]</td>
<td>1/2*</td>
</tr>
<tr>
<td>- output of heated-up water from the heater (HW)</td>
<td>[Js]</td>
<td>1/2*</td>
</tr>
<tr>
<td>- input for hot water circulation (HWc - it is plugged in the production plant)</td>
<td>[Js]</td>
<td>1/2*</td>
</tr>
<tr>
<td>- condensate exhaust</td>
<td>[mm]</td>
<td>Ø 16</td>
</tr>
<tr>
<td>- safety valve outlet</td>
<td>[Js]</td>
<td>3/4*</td>
</tr>
<tr>
<td>- gas inlet</td>
<td>[Js]</td>
<td>3/4*</td>
</tr>
<tr>
<td><strong>Connecting voltage</strong></td>
<td></td>
<td>1/N/PE 230 VAC 50 Hz TN-S</td>
</tr>
<tr>
<td><strong>Electric input, including the pump</strong></td>
<td>[W]</td>
<td>110</td>
</tr>
<tr>
<td><strong>Electric cover</strong></td>
<td>IP</td>
<td>41</td>
</tr>
</tbody>
</table>

### Tab. № 2  Thermal-technical parameters  
**comparative conditions 15 °C a 1013.25 mbar, dry gas**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design</strong></td>
<td></td>
<td>C₈₅</td>
</tr>
<tr>
<td><strong>Boiler power range</strong></td>
<td>[kW]</td>
<td>4 - 20</td>
</tr>
<tr>
<td><strong>Nominal thermal power 80/60 °C</strong></td>
<td>[kW]</td>
<td>18.8</td>
</tr>
<tr>
<td><strong>Minimal thermal power 80/60 °C</strong></td>
<td>[kW]</td>
<td>4</td>
</tr>
<tr>
<td><strong>Nominal thermal power 50/30 °C</strong></td>
<td>[kW]</td>
<td>20</td>
</tr>
<tr>
<td><strong>Minimal thermal power 50/30 °C</strong></td>
<td>[kW]</td>
<td>4</td>
</tr>
<tr>
<td><strong>Nominal thermal input</strong></td>
<td>[kW]</td>
<td>19.3</td>
</tr>
<tr>
<td><strong>Minimal thermal input</strong></td>
<td>[kW]</td>
<td>3.7</td>
</tr>
<tr>
<td><strong>Effectiveness at nominal thermal input of 80/60°C</strong></td>
<td>[%]</td>
<td>101.6</td>
</tr>
<tr>
<td><strong>Effectiveness at nominal thermal input of 50/30 °C</strong></td>
<td>[%]</td>
<td>108.1</td>
</tr>
<tr>
<td><strong>Effectiveness at minimal thermal input of 50/30 °C</strong></td>
<td>[%]</td>
<td>110.9</td>
</tr>
<tr>
<td><strong>Volume flow rate of fuel</strong></td>
<td>[m³.hour⁻¹]</td>
<td>0.4 - 2.1</td>
</tr>
<tr>
<td><strong>Mass flow rate of flue gases</strong></td>
<td>[kg.h⁻¹]</td>
<td>4.8 - 32</td>
</tr>
<tr>
<td><strong>NOx Class</strong></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td><strong>Flue gases temperature</strong></td>
<td>[°C]</td>
<td>30 - 85</td>
</tr>
</tbody>
</table>
**Requirements for information related to boiler heaters for heating the indoor premises, boiler combined heaters and combined heat and power heaters for heating the indoor premises**

**Model/s:** VIADRUS K5 D4L20XX

**Condensing boiler:** yes

**Low-temperature boiler:** no

**Boiler of type B1:** no

**Combined heat and power heater for heating the indoor premises:** no

**Combined heater:** yes

<table>
<thead>
<tr>
<th>Item</th>
<th>Marking</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal heating power</td>
<td>Prated</td>
<td>20</td>
<td>kW</td>
</tr>
</tbody>
</table>

For boiler heaters for heating the indoor premises and boiler combined heaters: useful heating power

At nominal heating power and high-temperature mode (*)

\[ P_4 = 20 \text{ kW} \]

At 30% of nominal heating power and low-temperature mode

\[ P_1 = 4 \text{ kW} \]

**Season energetic effectiveness of heating**

\[ \eta_s = 93 \% \]

For boiler heaters for heating the indoor premises and boiler combined heaters: useful effectiveness

At nominal heating power and high-temperature mode (*)

\[ \eta_t = 102 \% \]

At 30% of nominal heating power and low-temperature mode

\[ \eta_t = 110.7 \% \]

**Auxiliary electric energy consumption:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Marking</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>At full load</td>
<td>( \epsilon_{\text{max}} )</td>
<td>0.069</td>
<td>kW</td>
</tr>
<tr>
<td>At partial load</td>
<td>( \epsilon_{\text{min}} )</td>
<td>0.030</td>
<td>kW</td>
</tr>
<tr>
<td>In standby mode</td>
<td>( P_{\text{SB}} )</td>
<td>0.003</td>
<td>kW</td>
</tr>
</tbody>
</table>

**Other items:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Marking</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat loss in standby mode</td>
<td>( P_{\text{stby}} )</td>
<td>0.093</td>
<td>kW</td>
</tr>
<tr>
<td>Electric energy consumption of the igniting burner</td>
<td>( P_{\text{ign}} )</td>
<td>-</td>
<td>kW</td>
</tr>
<tr>
<td>Emission of nitrogen oxide</td>
<td>( NO_x )</td>
<td>31</td>
<td>mg/kWh</td>
</tr>
</tbody>
</table>

**For combined heaters:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Marking</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declared load profile</td>
<td>XL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily electric energy consumption</td>
<td>( Q_{\text{elec}} )</td>
<td>0.206</td>
<td>kWh</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Marking</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energetic effectiveness of water heating</td>
<td>( \eta_{\text{wh}} )</td>
<td>85</td>
<td>%</td>
</tr>
<tr>
<td>Daily fuel consumption</td>
<td>( Q_{\text{fuel}} )</td>
<td>22.828</td>
<td>kWh</td>
</tr>
</tbody>
</table>

**Contact data**

VIADRUS a.s.
Bezručova 300
Bohumín
735 81

(*) High-temperature mode of the condensing boilers is considered to be the return temperature 60 °C on the input into the heater and the input temperature 80 °C on the output from the heater.

(**) The low temperature for the condensing boilers is considered to be the return temperature 30 °C, for the low-temperature boilers - 37 °C, and for other heaters - 50 °C (on the input into the heater).
4 Boiler description

4.1 Boiler structure

1. boiler frame with insulation
2. heat-exchanger with bracket
3. electric fan
4. Venturi tube
5. HW reservoir with capacity of 60l with insulation
6. expansion tank 10l
7. hydro-block
8. gas valve
9. return boiler pipe
10. heating boiler pipe
11. bottom gas pipe
12. bottom gas pipe
13. heating water pipe
14. return water pipe
15. manual air-relief valve
16. siphon
17. condensate exhaust
18. electric panel with LMS control board, display and manometer
19. right side part of cladding with insulation
20. left side part of cladding with insulation
21. front part of cladding with insulation
22. hangup bracket
23. fume-extraction system DN60

Fig. №. 1 Boiler assembly

The base of the structure is a silumin heat-exchanger Furesoro 3 produced by Dejatech. This boiler is also equipped with a premix burner. Combustion mixture is mixed in the mixer with the preliminary defined proportion of air and gas in the whole power range. Air is mixed with gas in the mixer before the modulating fan, and the mixture is afterward combusted in the burner.

The boiler is also equipped with an electronic control unit LMS and a gas valve. Flame monitoring is provided by an ionizing electrode.

If you want to control the boiler equithermally, it is necessary to connect an outdoor sensor. In this case we recommend using one of communication devices, seeing chapter 5.3.

To increase the number of heating circuits, you can use an expansion module according to the project materials.
The lead-in of combustion air and the flue gases exhaust can be executed by several methods, namely:
- into the chimney,
- through the wall,
- through the roof (inclined or flat one),
- into the common well.

The boiler is a consumer in a design C, i.e. a closed one with electronic ignition and flame ionization.

## 5 Integrated stack heater

### Tab. №. 3 Technical parameters

<table>
<thead>
<tr>
<th>Technical parameters</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>l</td>
<td>56</td>
</tr>
<tr>
<td>Maximum permissible temperature °C</td>
<td>95</td>
<td></td>
</tr>
<tr>
<td>Maximum permissible pressure  bar</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Heat-exchanger area           m²</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>heat-exchanger volume         l</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>Power</td>
<td>kW</td>
<td>23.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Device height</td>
<td>L</td>
</tr>
<tr>
<td>Tank dimensions (without insulation)</td>
<td>Ø</td>
</tr>
<tr>
<td>Tank dimensions with insulation mm</td>
<td>455x455</td>
</tr>
<tr>
<td>Insulation from soft polyurethane foam mm</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connections</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cold water / hot water</td>
<td>R</td>
</tr>
<tr>
<td>Circulation</td>
<td>R</td>
</tr>
<tr>
<td>Central heating circulation (the supply, the return branch)</td>
<td>R</td>
</tr>
<tr>
<td>E-mouthpiece (heating spiral)</td>
<td>R</td>
</tr>
<tr>
<td>Sensor cover</td>
<td>R</td>
</tr>
<tr>
<td>Thermometer</td>
<td>inside thread</td>
</tr>
<tr>
<td>Water discharge</td>
<td>3/4″</td>
</tr>
<tr>
<td>Magnesium anode</td>
<td>An.</td>
</tr>
<tr>
<td>Weight (empty)</td>
<td>kg</td>
</tr>
</tbody>
</table>

| Fig. №. 2 Water heater       |       |
6 Placement and installation

6.1 Regulations and directives

a) for the heating system
ČSN 06 0310 Heat systems in buildings – Design and mounting
ČSN 06 0830 Heat systems in buildings – Securing devices
ČSN 07 7401 Water and steam for heat energetic equipment with steam operation pressure up to 8 MPa
EN 15502-1 Gas fuel boilers for central heating - Part 1: General requirement and tests
EN 15502-2-1 Gas fuel boilers for central heating - Part 2-1: A special norm for design C and boilers in designs B2, B3 and B5, with nominal heating input up to 1 000 kW
EN 677 Gas fuel boilers for central heating – Special requirements for condensing boilers with nominal heating power up to 70 kW

b) for the chimney
ČSN 73 4201 Design of chimneys and flue gas ducts – Design, fulfilment and connection of fuel consumers

b) regarding to fire-fighting regulations
ČSN 06 1008 Fire safety of heat equipment.
EN 13501 – 1 + A1 Fire classification of building products and building structures – Part 1: Classification according to results of tests for reaction to fire

d) for the hot water heating system
ČSN 06 0320 Heat systems in buildings – Preparation of hot water – Development and design
ČSN 06 0830 Heat systems in buildings – Securing devices
ČSN 75 5409 Indoor water distributions

e) for electric network
ČSN 33 0165 ed 2 Marking of conductors by colors or digits. Execution of provisions.
ČSN 33 1500 Electric-technical regulations. Revisions of electric devices.
ČSN 33 2000–1 ed 2 Low voltage electric installation – Part 1. Basic aspects, determination of basic characteristics, definitions.
ČSN 33 2000–4–41 ed 2 Low voltage electric installation – Part 4-41: Protective measures to ensure safety – Protection against electric shock
ČSN 33 2000–5–51 ed 3 Low voltage electric installation – Part 5–51. Selection and construction of electric devices – General regulations
ČSN 33 2000–7–703 ed.2 Electric installation of buildings – Part 7-703. Special equipment and equipment in special objects - Rooms and cabins with sauna stoves.
ČSN 33 2130 ed 3 Low voltage electric installation – Inside electric distributions.
ČSN 33 2180 Electric-technical regulations ČSN. Connection of electric devices and consumers.
ČSN 34 0350 ed.2 Safety requirements for movable power supplies and cords.
EN 60079-10-1 Explosive atmospheres – Part 10-1: Determination of dangerous premises – Explosive gaseous atmospheres
EN 60079-14 ed.3 Explosive atmospheres – Part 14: Development, selection and performance of electric installations
EN 60335 – 1 ed.3 Electric consumers for household and similar purpose – Safety – Part 1: General requirements.
EN 60335-2-102 Electric consumers for household and similar purpose – Safety – Part 2-102: Special requirements for consumers combusting gaseous, oil and solid fuels, containing electric connections.
EN 60 445 ed. 4 Basic and safety principles for the human-machine interface, marking and identification – Identification of clamps of subjects, ends of conductors and conductors

f) for gas distribution
EN 1775 Gas supply - Gas pipelines in buildings - Maximal operation pressure <= 5 bar - Operation requirements.
EN 12007-1 Equipment for gas supply - Gas pipeline with maximal operation pressure up to 16 bar including - Part 1: General functional requirements
EN 12007-2 Equipment for gas supply - Gas pipeline with maximal operation pressure up to 16 bar including - Part 2: Specific functional requirements for polyethylene (maximal operation pressure up to 10 bar including)
EN 12007-3 Equipment for gas supply - Gas pipeline with maximal operation pressure up to 16 bar including - Part 3: Specific functional requirements for steel
EN 12007-4 Equipment for gas supply - Gas pipeline with maximal operation pressure up to 16 bar including - Part 4: Specific functional requirements for reconstruction
ČSN 07 0703 Boiler rooms with gas fuel equipment.
6.2 Possibilities of placement

Upon installation and usage of the boiler, it is necessary to observe all requirements of ČSN 06 1008.

The boiler has to be placed in accordance with the project documentation. Flue gases exhaust has to comply with the valid regulations. Orifices of separate pipelines for combustion air supply and flue gases exhaust have to be located so that they are placed inside a square with the side of 50 cm at the boiler. The boiler can be only placed on the wall with a guaranteed bearing capacity. The following minimum distances have to be near and above the boiler: 0,2 m and in front of the boiler 1 m for mounting and repairs, and with regards of fire-fighting regulations. The manufacturer recommends placing these products in closed heating systems.

The boiler can be placed in a room with usual environment according to EN 33 2000-1 ed 2.

Fig. No. 3 The main boiler dimensions

Boiler placement with regard of fire-fighting regulations:

Safety distance from flammable materials:
- during installation and at operation of the boiler it is necessary to observe a safety distance 200 mm from flammable materials with the combustibility grade A1, A2, B and C (D);
- for lightly combustible materials with the combustibility grade E (F), which quickly burn and burn themselves even after removal of the ignition source (for example, paper, paste-board, cardboard, asphalt- and tarboard, wood and fiberboards, plastics, floor cloths) the safety distance is doubled, it means to 400 mm;
- the safety distance is to be also doubled in case when the grade of reaction to fire is not proven.

Tab. No. 4 Grade of reaction to fire

<table>
<thead>
<tr>
<th>Grade of reaction to fire</th>
<th>Examples of building materials and products included in the reaction of fire (extract from EN 13501-1+A1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 — incombustible</td>
<td>Granite, sandstone, concrete, bricks, ceramic tiles, mortars, fireproof plasters,...</td>
</tr>
<tr>
<td>A2 — hardly combustible</td>
<td>Acumin, izumin, heraklit, lignos, boards and basalt felt, fibreglass boards,...</td>
</tr>
<tr>
<td>B — heavily combustible</td>
<td>Beech and oak wood, hobrex boards, plywood, werzalit, umakart, sirkolit,...</td>
</tr>
<tr>
<td>C (D) — moderately combustible</td>
<td>Pinewood, larch, whitewood, chipboard and cork boards, rubber flooring,...</td>
</tr>
<tr>
<td>E (F) — lightly combustible</td>
<td>Asphaltboard, fibreboards, cellulose materials, polyurethane, polystyrene, polyethylene, PVC,...</td>
</tr>
</tbody>
</table>
6.3 Delivery and accessories content

The boiler VIADRUS K5 is supplied in an assembled state on a pallet, packed in a cardboard cover and protected by a foil.

**Standard accessories for all versions of the boiler:**
Manual for operation and installation of the boiler, containing a warranty certificate
List of contractual service organizations

**Recommended accessories for all versions of the boiler:**
One of space communication devices Siemens QAA74, QAA75, QAA55, QAA58 (wireless), QAA78 (wireless) 1 pc
Outdoor sensor QAC 34/101 1 pc

Recommended accessories are not included in the basic price of the boiler.

6.4 Boiler mounting

According to the marked outlets, the boiler is connected to the heating system, including hot water and the gas distribution according to fig. No. 6. Connection of the condensate exhaust has to comply with legal norms ČSN and EN. Further, the flue gases exhaust is connected according to the project.

---

**Fig. №. 4** Connection dimensions

1. heating water input from the heating system 3/4”
2. heating water output into the heating system 3/4”
3. gas inlet
4. hot water output from the heater 1/2”
5. circulation 1/2” (a plug is inserted in the production plant)
6. service hole of the anode rod
7. cold water input into the heater 1/2”
8. overpressure valve drainage
9. condensate exhaust Ø 25
10. siphon cleaning hole

---

**Fig. №. 5** Bottom view of the boiler
6.5 Electric connection diagram

Fig. No. 6 Circuit connection diagram
CONDUCTORS COLORS
bn (brown)
bu (blue)
bl (black)
gn (green)
gnye (green/yellow)
rd (red)
ye (yellow)

LEGEND:
A1 Control unit
A2 Kindling transformer with gas valve
A3 Control panel AVS37
B2 Boiler temperature sensor - output
B3 HW temperature sensor - output
B7 Boiler temperature sensor - input
B9 External temperature sensor
B38 HW temperature sensor - input
E1 Kindling electrode
E2 Monitoring electrode
MV1 Fan
PS1 Water pressure sensor
Q1 Pump
X5b Outputs connector
X5a X5b selected inputs connector
X17 Three-way valve and selected outputs connector
X16 PWM fan control connector
X15 PWM pump control connector
X14 Protective thermostat connector
X13 BOILER CLADDING
X12 Programmable connectors
X11 Connector for connection of OCI 345
X10a PWM-1-108 outputs connector
X10 Protective clamps
X1 Control unit
X1 Three-way valve
X1 Three-way valve
X6a X6b selected inputs connector
X6b X6a selected inputs connector
X5a X5b selected inputs connector
X7a Connection of room devices (QAA 74, 75...)
X8 PWM fan control connector
X7 Programmed connectors
X6 Programmable connectors
X5 PWM pump control connector
X4 Temperature sensors and Reset button connector
X3 Selected inputs connector
X2 Kindling transformer and gas valve connector
X1 Fan and pump power supply connector
W1 230VAC 50Hz 1/N/PE
WL1 BOILER CLADDING
WL4 BOILER
WL5 BOILER CLADDING
WL6 BOILER CLADDING
WL7 BOILER CLADDING
WL8 BOILER CLADDING
WL9 BOILER CLADDING
WL10 BOILER CLADDING
WL11 BOILER CLADDING
WL12 BOILER CLADDING
WL13 BOILER CLADDING
WL14 BOILER CLADDING
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WL143 BOILER CLADDING
WL144 BOILER CLADDING
WL145 BOILER CLADDING
WL146 BOILER CLADDING
WL147 BOILER CLADDING
WL148 BOILER CLADING
7 Commissioning

7.1 Connection to the heating system and watering the system

Before watering the heating system, it is necessary to clean properly this system, i.e. at least two times fill the system with clean water and afterward drain it.

Water serving for watering the heating system has to be clean and colorless, without suspended substances, without oil and without chemically aggressive substances. The heating system has to be filled up with water, which complies with requirements of ČSN 07 7401, and mainly its hardness mustn't exceed the required parameters. Parameters of circulating and additive water have to comply:

Tab. №. 5 The maximum permissible values of heating water according to ČSN 07 7401

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Recommended values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness</td>
<td>mmol/l</td>
</tr>
<tr>
<td>Ca^{2+}</td>
<td>0.3</td>
</tr>
<tr>
<td>Concentration of total Fe + Mn</td>
<td>mg/l</td>
</tr>
</tbody>
</table>

"Recommended value"

WARNING!!! The manufacturer doesn't recommend using of antifreeze mixtures.

In case that water hardness doesn't comply with requirements, then it has to be modified. Even multiple heating water with higher hardness will not prevent from excluding salts on the walls of the boiler drum. Sedimentation of 1 mm of limestone reduces the heat transmission from metal to water by 10 % in the given place.

During the heating season it is necessary to maintain the constant volume of heating water in the heating system and be particular in the heating system is deaerated. Water from the boiler and the heating system mustn't be discharged or withdrawn for using, except the necessarily needed cases, such as repairs and so on. Emptying heating water and filling-up of new water increases a danger of corrosion and creation of water stone. If it is necessary to add water into the heating system, please only add it to the cooled boiler, in order to prevent bursting the section.

- During filling-up water into the boiler, the system has to be disconnected from the electric power supply network.
- The air-relief valve on the boiler and on the heating system has to be opened and has to be workable.
- Adjust the expansion tank to the pressure by 10 kPa (0.1 bar) higher than the pressure required in the heating system. Pressurize the system to the required pressure about 100 kPa (1 bar) and again deaerate. For the purpose of watering, we recommend using a filter on the input into the heating system.
- The heating system has to have a sufficient number of deaerating points. A discharge valve has to be mounted in the lowest place of the heating system.
- The expansion tank has the capacity of 10 liters, and its volume is enough for about 150 l of water in the heating system.
- The system should be designed for the temperature gradient of 55/45 °C due to using the condensation.
- The condensing boiler can be also used for old gravity systems, which were over-dimensioned, and thanks to it the condensation can be effectively used also for this system; however it is necessary to complete this system with a corresponding expansion tank.
- The condensing boiler is equipped with a low-energetic pump with PWM control Wilo Yonos Para RS 15/7.5. The modulation pump is controlled by the control unit of the boiler according to the selected strategy.
- The connection to the heating system, hot water and gas is to be performed through spherical valves.
7.2 Gas connection

Before connecting the gas pipeline to the boiler, the gas pipeline has to be tested and revised. After connecting the boiler to the gas pipeline, it is necessary to test all gas joints by a gas detector or with using of foam solution. The input pressure of natural gas is about 2 kPa (20 mbar).

During checking tightness of the gas distribution and connecting the valve, it is necessary to be particular about not wetting the coil of the gas valve!

7.3 Connection to the electric power supply network

The boiler is equipped with a flexible mains connection and a fork. According to EN 60 335–1 ed. 3, EN 1856-1, the boiler has to be placed so that the fork is accessible.
A socket 230 V/50 Hz has to be placed near the boiler on the distance up to 1.5 m. The socket has to comply with the legal regulations and has to be revised.

7.4 Condensate exhaust

For the purpose of condensate exhausting, an inbuilt siphon is used, to which an overflow into the sewer has to be connected. Before commissioning the boiler, it is necessary to check that condensate is exhausted. The PVC discharge pipe diameter is Ø 16 mm.
This condensate has pH 4 and it can be discharged in the sewer without subsequent treatment. Boiler condensate exhaust has to be performed so that it doesn't prevent from smooth drain of condensate. The condensate exhaust system, if installed, mustn't be modified or blocked.

7.5 Fume-extraction system

According to the method of flue gases exhaust and supply of combustion air, the boiler is in design C. It means a closed consumer, which uses combustion air from the external space or from a common well, and from which the flue gases are exhausted into the external space or into the common well. The well is a constructional part of the building, for example, a chimney, etc. The combustion chamber and the flue channel of the consumer are gas-tightly separated from the space, in which the consumer is located.
The boiler is supplied in a standard design with a flange for air. The fume-extraction system of the boiler is not a part of the boiler supply. It is necessary to keep an incline of 3° to the boiler. The pressure loss for fume-extraction mustn't exceed 150 Pa. The total pressure loss is a sum of separate losses of the parts described in this chapter.
The boiler has to be only installed with a wind-protective device, which complies with requirements of EN 1856-1 (see the annex N). It is necessary to use a concentrated small chimney for flue gases exhaust through the roof.
The boiler has to be installed with the needed accessories (a pipeline for supply of combustion air and for exhausting flue gases).

Fig. №. 9  Possibilities of connection of flue gases exhaust and air supply
The fume-extraction system of ALMEVA is approved and recommended for the boiler VIADRUS K5 in the following design:

- Star D80mm
- Flex D80 mm
- LIK 60/100 mm

Recommended fume-extraction system can be ordered for the boiler.

The boiler in design C is further in detail specified by a two-digit number:

- the first digit in the index is related to a possible installation of the boiler with regard to the method of supplying combustion air and exhausting flue gases,
- the second digit in the index is related to using and placement of an inbuilt fan in the boiler. The boiler VIADRUS K5 is a boiler with the fan embedded before the combustion chamber/the heat-exchanger (the boiler drum) and is marked by the second digit „3“ of the index.

**Design C₁**

It is the boiler in design C, which by its pipeline is connected to the protective horizontally installed orifice either on the external wall, or on the roof of the building. The outfalls of these pipelines either are concentrated, or are mutually placed so close to each other that they are a subject of the same atmosphere conditions.

The output holes of the mouthed separate pipelines for supplying combustion air and for exhausting flue gases have to be placed inside the square with the side of 50 cm.

The wind-protection device can be placed on a wall and/or the roof, according to the performed installation.

**Design C₂**

It is the boiler in design C, which by its pipeline is connected to the vertically installed protective orifice. The outfalls of these pipelines either are concentrated, or are mutually placed so close to each other that they are a subject of the same atmosphere conditions.

The output holes of the mouthed separate pipelines for supplying combustion air and for exhausting flue gases have to be placed inside the square with the side of 50 cm, and the distance between the planes of two holes has to be less than 50 cm.

**Design C₃**

The boilers in design C₃ with their connecting pipelines are suitable for connection only to a chimney with a natural draught. The boiler in design C, which by its pipeline, with possibility of using a reducer, is connected to the common well. The outfalls of these pipelines either are concentrated, or are mutually placed so close to each other that they are a subject of the same atmosphere conditions.

The boiler has to be installed with the shortest length of the pipeline for supplying combustion air and for exhausting flue gases. The suction effect used for the pipeline for exhausting flue gases doesn't invoke vacuum 50 Pa. The given connection can be used with systems of company ALMEVA.

The maximum pressure loss admissible in the pipeline for supplying combustion air and for exhausting flue gases = 150 Pa, the minimum pressure loss admissible in the pipeline for supplying combustion air and for exhausting flue gases = 17 Pa.

The flow of condensate into the boiler is not allowable.

Temperature of flue gases upon overheating 85 °C. Volume concentration CO₂ max. 9,5 %.

**Design C₄**

The wind-protection device for the pipeline for supplying combustion air and for exhausting flue gases mustn't be implemented on the opposite walls of the building.

**Design C₅**

It is the boiler in design C, which by its pipeline, optionally with using a reducer, is connected on the side of supply of air to the protective orifice, and on the side of exhaust of flue gases to a separate or a common chimney.

The chimney has to be equipped with a special insert, determined for the condensing boiler, and with an exhaust of condensate from the chimney.

The boiler VIADRUS K5 can be used with a plastic insert with the thermal resistance of 120 °C, for example produced by ALMEVA.

The boiler has to be only installed with a wind-protective device, which complies with requirements of EN 1856 -1 (see the annex N).

The flow of condensate into the boiler is not allowable.

Temperature of flue gases upon overheating 85 °C. Volume concentration CO₂ max. 9,5 %.

In case of ducting a concentrated pipeline, which is led in the non-heated or the external space, it is necessary to install a collector before the boiler (60/100 - LPKFK5, ordering code 20 175 or 80/125 - LPKFK8, ordering code 20 176), which collects fogged water originated on the inside surface of the air pipeline.
In case of using a fume-extraction system in the design of a vertical small chimney, which goes through a cold roof, it is necessary to buy additionally a LIK condensate exhauster 60/100 (LPKF5, ordering code 20175) or LIK condensate exhauster 80/125 (LPKF8 ordering code 20176), which collects fogged water originated on the surface of the small chimney.

A proposal for design of the fume-extraction system and the air supply, including theirs lengths, shall be performed by a designer in the technical documentation on the basis of the project supporting documents VIADRUS.

Remark: Number of components for separate types of designs depends on the placement of the boiler.

7.6 Fume-extraction system – example of a correct connection of the flue gas ducting and the air suction

![Fig. No. 10](image)

7.7 Fume-extraction system – example of an incorrect connection of the flue gas ducting and the air suction

![Fig. No. 11](image)

7.8 Connection of the system STARR D80 and FLEX 80

![Fig. No. 12](image)

1. Flue gases exhaust
2. Air suction
7.8.1 Fume-extraction diagram, type STARR, 2 x D 80 mm

Chimney plastic head starr (complete)

Anti-raining packing

End pipe without orifice

Universal distance bushing

Pipe with orifice

Revision T-piece

Revision door

Pipe with orifice

Foot elbow 87° with anchorage

LIB pipe part with rim

Revision T-piece

Pipe with orifice

Revision T-piece with drain

Elbow 45°

Revision T-piece with changing direction

Revision elbow 87°

Boiler reducer - centric

Revision T-piece with drain and with changing direction

Siphon Long John (for overpressure)
7.8.2  Fume-extraction diagram, type FLEX, 2 x D 80 mm

Anti-raining packing

End pipe without orifice

End pipe flex

End plastic head flex (complete)

End plastic head starr (complete)

Universal distance bushing

Revision door

Ventilation grid

Revision T-piece flex/starr

Revision T-piece flex/flex

Flexible hose

Adaptor starr/flex

Food elbow 87° with anchorage

Revision T-piece with drain and with changing direction flex

Siphon Long John (for overpressure)

Adaptor starr/flex 87°

Fig. No. 14
7.9 Connection of the system LIK 60/100

1. Flange 60/100
2. Screw M4 x 12
Fig. № 15

A proposal for design of the fume-extraction system and the air supply, including theirs lengths, shall be performed by a designer in the technical documentation.

Remark: Number of components for separate types of designs depends on the placement of the boiler.
7.11 Pressure losses of elements of fume-extraction system in using the boiler VIADRUS K5

max. fan pressure 150Pa

<table>
<thead>
<tr>
<th>Divided fume-extraction - flue gases</th>
<th>Ordering code</th>
<th>code</th>
<th>DN</th>
<th>Name</th>
<th>Loss in Pa</th>
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<tbody>
<tr>
<td></td>
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<tr>
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<td>80</td>
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<td>Elbow 45°</td>
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<td>80</td>
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<td>Elbow 87°</td>
<td>1.7</td>
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<td>20133</td>
<td>PPRM18</td>
<td>80</td>
<td></td>
<td>Pipe 1m</td>
<td>3.4</td>
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<tr>
<td>20111</td>
<td>PPSAS8</td>
<td>80</td>
<td></td>
<td>Plastic chimney head starr (complete)</td>
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</table>

<table>
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<tr>
<th>Divided fume-extraction - suction</th>
<th>Ordering code</th>
<th>code</th>
<th>DN</th>
<th>Name</th>
<th>Loss in Pa</th>
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<td>20133</td>
<td>PPRM18</td>
<td>80</td>
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<td>Pipe 1m</td>
<td>2.5</td>
</tr>
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<table>
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<tr>
<th>Concentrated fume-extraction</th>
<th>Ordering code</th>
<th>code</th>
<th>DN</th>
<th>Name</th>
<th>Loss in Pa</th>
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<td>Elbow 45°</td>
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<td>Elbow 87°</td>
<td>7.5</td>
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<tr>
<td>20199</td>
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<td>Pipe 1m</td>
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<tr>
<td>20197</td>
<td>LPZTK5</td>
<td>60/100</td>
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<td>LIK T-piece for air supply</td>
<td>5</td>
</tr>
<tr>
<td>20235</td>
<td>LPASK5</td>
<td>60/100</td>
<td></td>
<td>LIK pipe part for facade fume-extraction</td>
<td>10.5</td>
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<tr>
<td>20221</td>
<td>DPDS45</td>
<td>60/100</td>
<td></td>
<td>Roof extension (complete)</td>
<td>29.8</td>
</tr>
</tbody>
</table>

7.12 Commissioning the boiler

The whole installation has to comply with regulations related to this equipment. The boiler has to be compatible with the local connection conditions (check parameters of the boiler with the date on the name-plate). Commissioning the boiler may be only performed by organizations nominated for this activity and trained by the manufacturer. Minimum pressure in the heating system is 0.8 bar. It is necessary to check all shutters and check that no gas escapes. Connect the boiler to the electric power supply network. Check the gas distribution behind the gas valve. Check functionality of the safety valve. Further it is necessary to check the motion of the pump. Check functionality of the three-way valve (if used). During running the boiler it is necessary to check exhaust of condensate both from the boiler, and eventually from the liner.

Upon the first commissioning the boiler it is necessary to train the user in accordance with this manual and hand over the manual to the user with a confirmation of commissioning.

Further it is necessary to:
- check the revision before commissioning,
- check the tightness of water escape,
- check regulation and safety elements.

Production settings of the emission value of the boiler:
CO₂ – minimum boiler power 9,2 %,
- nominal boiler power 9,2 %,

Comparative conditions 15 °C and 1013,25 mbar, dry gas

Concrete measured values depend on type of connection of combustion air supply and flue gases exhaust to the given consumer.
Set values CO₂ have to be observed.
7.13 Instructions before commissioning

Before commissioning it is necessary to check:

**The supply valve of the expansion tank.** The pressure in the expansion tank has to be adjusted according to the project of the heating system. The pressure in the expansion tank has to be checked during an annual regular service inspection.

**The air-relief valve of the heat-exchanger and the water heater.** Upon deaeration, use, for example, a silicone hose ø 6 mm, which is a part of the boiler, and a vessel for prevention from escaping water into the boiler control unit.

Release the screw on the valve; in case that the system is aerated, air would start escaping from the heat-exchanger. At the moment when water starts leaking, the heat-exchanger is considered to be deaerated, and you may tighten the screw again. Repeat this procedure several times until the system is fully deaerated.

**The automatic air-relief valve of the pump** has to remain permanently opened.

**The minimum water pressure in the heating system** is 0.8 bar, the maximum operation pressure is 2.5 bar. During watering and deaeration of the system it is necessary to adjust the pressure in the heating system to the values according to the project of the heating system.

8 Operating the boiler by an user

8.1 General description

The boiler is equipped with a control unit LMS14. The display AVS37 serves for setting the parameters. It is necessary to observe the hydraulic connection for correct function of the boiler. The project supporting documents are developed for these purposes. The boiler is adjusted in the production plant so that it heats to the adjusted boiler temperature (parameter 742). It is commutated by means of a jumper on the input H5. In case of connection of the commutating space device to the input H5, it is necessary to remove the jumper.

We also recommend using an outdoor sensor by reason of equithermal heating and using time diagrams. Further we recommend using a communicating space device according to the offer, see chapter 5.3.

The control unit is determined for control by means of extension modules of 1 to 3 mixing heating circuits, hot water, a cascade, a swimming pool, a wooden boiler, etc. (see the project supporting documents VIADRUS). Other possible method of commutation of the boiler is with help of 0 - 10 V through the input H1. In this case the boiler is the only the source of heat.

8.2 Display description

Having pressed the button OK (E), you enter in the setting mode, where by means of a rotary button (D) you may move around the menu or correct a value of the required parameter. Having pressed the button OK, you enter in the required menu or the parameter, and confirm the selected value of the parameter.

![Diagram of the display and buttons](image)

A Switch of operation mode of HW
B Button RESET
C Button ESC
D Adjusting knob of space temperature
E Confirming button OK
F Button of manual operation
G Button Sweeper
H Switch of operation modes for heating circuits
I Display
J Information button

Fig. №. 16

A Switch of operation mode of HW - ON/OFF of heating of HW
B Button RESET - unlocking a burner failure (press for about 3 s)
C Button ESC - return to menu by one step back (the selected value is not saved)
D Adjusting knob of space temperature - selection of space temperature or selection in menu
E Confirming button - shifting in menu by one step forward and confirmation of the selected value
**F** Button of manual operation - actuation of the boiler to the preselected temperature 60 °C, all pumps run, the mixer is not controlled - a symbol will displayed on the display.

**G** Button Sweeper - at a short press of the button, the boiler will go to the emission measuring mode. This button serves for authorized service technician.

**H** Switch of operation modes for heating circuits
- running according to the preselected time mode (a transition to the summer mode on the basis of outdoor temperature is active)
- continuous running to the nominal required temperature
- continuous running to the dumping required temperature
- keeping the anti-frost required space temperature

**I** Display

**J** Information button - information of the actual state of the boiler, heating circuits, HW and error messages.

### 8.2.1 Energy saving
- Use automatic mode.
- Set the required comfort temperature.
- Use a time program.

The main rule is to remain a type of operation in the Automat mode: In this type of operation the regulator monitors heating for optimal heat consumption (for example: transition summer/winter). Or you can individually adjust a type of operation to the anti-frost, permanent dumping, comfort, in dependence on your needs.

Set a comfort temperature, which has to be maintained during the period of using the room, thus during the period which is set in the time program.

Use a time program to set the period, when a comfort temperature has to be maintained, and out of the comfort temperature the regulator will heat to the dumping temperature. Setting the time program should comply with an occupation of the room or the night dumping. The time program is only used in the Automatic type of operation.

**8.3 Review of settings**

The tables displays all user-accessible settings.

#### Time and date

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Function</th>
<th>Production settings</th>
<th>Min.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Time</td>
<td>----</td>
<td>00:00</td>
<td>23:59</td>
<td>hh:mm</td>
</tr>
<tr>
<td>1</td>
<td>Date</td>
<td></td>
<td>01.01</td>
<td>31.12</td>
<td>dd:MM</td>
</tr>
<tr>
<td>5</td>
<td>The start of the summer time</td>
<td>25.03.</td>
<td>01.01.</td>
<td>31.12.</td>
<td>dd:MM</td>
</tr>
<tr>
<td>6</td>
<td>The end of the summer time</td>
<td>25.10.</td>
<td>01.01.</td>
<td>31.12.</td>
<td>dd:MM</td>
</tr>
</tbody>
</table>

The actual date and time has to be set by reason of a correct function of the time programs of the heating circuits and hot water.

#### Time program TO1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Function</th>
<th>Production settings</th>
<th>Min.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>Preselection</td>
<td>Mo-Su</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>501</td>
<td>Mo-Su: 1. Phase on</td>
<td>6:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>502</td>
<td>Mo-Su: 1. Phase off</td>
<td>22:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>503</td>
<td>Mo-Su: 2. Phase on</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>504</td>
<td>Mo-Su: 2. Phase off</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>505</td>
<td>Mo-Su: 3. Phase on</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>506</td>
<td>Mo-Su: 3. Phase off</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>516</td>
<td>Standard values</td>
<td>Su</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. (2, 3) Phase on - the start of the heating phase to the selected comfort temperature.
1. (2, 3) Phase off - the end of the heating phase to the selected comfort temperature and the transition to the dumping temperature.

Standard values - reset of the time program to the production values.
### Time program TO2 (only in a case, that it is activated)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Function</th>
<th>Production settings</th>
<th>Min.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>520</td>
<td>Preselection</td>
<td>Mo-Su</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>521</td>
<td>Mo-Su: 1. Phase on</td>
<td>6:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>522</td>
<td>Mo-Su: 1. Phase off</td>
<td>22:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>523</td>
<td>Mo-Su: 2. Phase on</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>524</td>
<td>Mo-Su: 2. Phase off</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>525</td>
<td>Mo-Su: 3. Phase on</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>526</td>
<td>Mo-Su: 3. Phase off</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>536</td>
<td>Standard values</td>
<td>Su</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Time program 3/TO3

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Function</th>
<th>Production settings</th>
<th>Min.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>540</td>
<td>Preselection</td>
<td>Mo-Su</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>541</td>
<td>Mo-Su: 1. Phase on</td>
<td>6:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>542</td>
<td>Mo-Su: 1. Phase off</td>
<td>22:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>543</td>
<td>Mo-Su: 2. Phase on</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>544</td>
<td>Mo-Su: 2. Phase off</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>545</td>
<td>Mo-Su: 3. Phase on</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>546</td>
<td>Mo-Su: 3. Phase off</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>556</td>
<td>Standard values</td>
<td>Su</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Time program 4/TV

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Function</th>
<th>Production settings</th>
<th>Min.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>560</td>
<td>Preselection</td>
<td>Mo-Su</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>561</td>
<td>Mo-Su: 1. Phase on</td>
<td>6:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>562</td>
<td>Mo-Su: 1. Phase off</td>
<td>22:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>563</td>
<td>Mo-Su: 2. Phase on</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>564</td>
<td>Mo-Su: 2. Phase off</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>565</td>
<td>Mo-Su: 3. Phase on</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>566</td>
<td>Mo-Su: 3. Phase off</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>576</td>
<td>Standard values</td>
<td>Su</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Time program 5

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Function</th>
<th>Production settings</th>
<th>Min.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>Preselection</td>
<td>Mo-Su</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>601</td>
<td>Mo-Su: 1. Phase on</td>
<td>6:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>602</td>
<td>Mo-Su: 1. Phase off</td>
<td>22:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>603</td>
<td>Mo-Su: 2. Phase on</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>604</td>
<td>Mo-Su: 2. Phase off</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>605</td>
<td>Mo-Su: 3. Phase on</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>606</td>
<td>Mo-Su: 3. Phase off</td>
<td>24:00</td>
<td>00:00</td>
<td>24:00</td>
<td>hh:mm</td>
</tr>
<tr>
<td>616</td>
<td>Standard values</td>
<td>Su</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Holidays TO1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Function</th>
<th>Production settings</th>
<th>Min.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>641</td>
<td>Preselection</td>
<td></td>
<td>1</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>642</td>
<td>Start</td>
<td>-</td>
<td>01.01</td>
<td>31.12</td>
<td>dd.MM</td>
</tr>
<tr>
<td>643</td>
<td>End</td>
<td>-</td>
<td>01.01</td>
<td>31.12</td>
<td>dd.MM</td>
</tr>
<tr>
<td>648</td>
<td>Type of operation</td>
<td>Anti-frost protection</td>
<td>Anti-frost protection, Dumping</td>
<td>hh:mm</td>
<td></td>
</tr>
</tbody>
</table>

### Holidays selected type of operation Heating for the period of long-term absence. The function is activated on the date, set in the parameter 642, and is ended in 00:00 hour on the date, set in the parameter 643.

### Holidays TO2 (only in a case, that it is activated)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Function</th>
<th>Production settings</th>
<th>Min.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>651</td>
<td>Preselection</td>
<td></td>
<td>1</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>652</td>
<td>Start</td>
<td>-</td>
<td>01.01</td>
<td>31.12</td>
<td>dd.MM</td>
</tr>
<tr>
<td>653</td>
<td>End</td>
<td>-</td>
<td>01.01</td>
<td>31.12</td>
<td>dd.MM</td>
</tr>
<tr>
<td>658</td>
<td>Type of operation</td>
<td>Anti-frost protection</td>
<td>Anti-frost protection, Dumping</td>
<td>hh:mm</td>
<td></td>
</tr>
</tbody>
</table>
Holidays TO3 (only in a case, that it is activated)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Function</th>
<th>Production settings</th>
<th>Min.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>661</td>
<td>Preselection</td>
<td></td>
<td>1</td>
<td>8</td>
<td>-</td>
</tr>
<tr>
<td>662</td>
<td>Start</td>
<td>-</td>
<td>01.01</td>
<td>31.12.</td>
<td>dd.MM</td>
</tr>
<tr>
<td>663</td>
<td>End</td>
<td>-</td>
<td>01.01</td>
<td>31.12.</td>
<td>dd.MM</td>
</tr>
<tr>
<td>668</td>
<td>Type of operation</td>
<td>Anti-frost protection</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Heating circuit 1

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Function</th>
<th>Production settings</th>
<th>Min.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>710</td>
<td>Comfort temperature</td>
<td>20</td>
<td>Row 712</td>
<td>Row 716</td>
<td>°C</td>
</tr>
<tr>
<td>712</td>
<td>Dumping temperature</td>
<td>16</td>
<td>Row 714</td>
<td>Row 710</td>
<td>°C</td>
</tr>
<tr>
<td>714</td>
<td>Anti-frost temperature</td>
<td>10</td>
<td>4</td>
<td>Row 712</td>
<td>°C</td>
</tr>
<tr>
<td>720</td>
<td>The slope of the heating curve</td>
<td>1.5</td>
<td>0.10</td>
<td>4.00</td>
<td>-</td>
</tr>
<tr>
<td>730</td>
<td>Automatics summer/winter</td>
<td>18</td>
<td>---/8</td>
<td>30</td>
<td>°C</td>
</tr>
<tr>
<td>742</td>
<td>Req. T Start of space Thermostat</td>
<td>65</td>
<td>Row 740</td>
<td>Row 741</td>
<td>°C</td>
</tr>
<tr>
<td>855</td>
<td>Act. req. temp. of drying</td>
<td>---</td>
<td>0</td>
<td>90</td>
<td>°C</td>
</tr>
<tr>
<td>856</td>
<td>Actual date of drying</td>
<td>---</td>
<td>0</td>
<td>32</td>
<td>-</td>
</tr>
</tbody>
</table>

- **Comfort temperature**: required space temperature, which will be maintained in the heating phase.
- **Dumping temperature**: required space temperature, which will be maintained in the dumping phase.
- **Anti-frost temperature**: setting the required anti-frost space temperature.
- **Heating curve slope**: this value means the setting of the heating curve, see fig. 16
- **Automatics summer/winter**: the temperature limit for the transition between the summer and the winter mode.
- **Req. T Start of space Thermostat**: temperature, to which the boiler will heat in case that no outdoor sensor is used.
- **Act. req. temp. of drying**: temperature setting for the floor heating drying.
- **Actual date of drying**: setting of the date of the floor heating.

**Nominal temperature** setting of the required comfort temperature of hot water.

The adjusted heating curve uses the required temperature in the space from 20 °C. If the required/space temperature changes, the heating curve is also changed. The heating curve displays the required temperature into the heating circuit in dependence on the corrected outdoor temperature.

At using the space devices QAA74, QAA75 etc. the heating curve is extra corrected by the parameters Adjusted space temperature and Influence of space.

![Heating curve slope](image)

**Fig. №. 17** Heating curve slope
8.4 Error messages

The table 6 contains a list of the most frequent error states of the boiler. In case of other error code, it is necessary to call the service.

<table>
<thead>
<tr>
<th>Error code</th>
<th>Error description</th>
<th>Cause/solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Short circuit/interruption of the outdoor temperature sensor</td>
<td>• Check the outdoor temperature sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Call the service</td>
</tr>
<tr>
<td>50</td>
<td>Short circuit/interruption of the hot water sensor</td>
<td>• Check the hot water sensor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Call the service</td>
</tr>
</tbody>
</table>
| 110        | The boiler is overheated, the electronic safety thermostat switched off.          | • Wait until the equipment is cooled down and switch on it again by pressing the button Reset  
|            |                                                                                   | • In case of repeated occurrence of the error, contact the service |
| 111        | The pump is defect or the thermostatic valves are closed, a temperature sensor was initiated. | • Open the thermostatic valves                       |
|            |                                                                                   | • In case of repeated occurrence of the error, contact the service |
| 119        | The water pressure switch was initiated.                                          | • Check water pressure, and in case of too low pressure, add water |
| 128        | Flame loss during operation                                                       | • Start the boiler again by pressing the button Reset |
|            |                                                                                   | • In case of repeated occurrence of the error, contact the service |
| 133        | The control and regulation unit is blocked. Possible causes: lack of gas, kindling is not started | • Start the boiler again by pressing the button Reset |
|            |                                                                                   | • In case of repeated occurrence of the error, contact the service |
### 8.5 Failures

<table>
<thead>
<tr>
<th>Failure</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>The boiler doesn't kindle</td>
<td>The boiler is without voltage</td>
<td>• Check, whether the supply cord is in the socket and whether there is voltage in the socket.</td>
</tr>
<tr>
<td></td>
<td>Insufficient or interrupted gas supply</td>
<td>• Check that the main gas supply and the shut-off valve of the boiler are opened</td>
</tr>
<tr>
<td></td>
<td>There is no requirement for the heating and how water</td>
<td>• Check settings of the operation mode</td>
</tr>
<tr>
<td></td>
<td>Incorrect date and time setting</td>
<td>• Set date and time</td>
</tr>
<tr>
<td></td>
<td>The boiler is in the summer mode (is switched off by the outdoor temperature)</td>
<td>• The boiler can be initiated by means of switching-over the operation mode to the permanent comfort</td>
</tr>
<tr>
<td></td>
<td>Low water pressure</td>
<td>• Fill up water into the system</td>
</tr>
<tr>
<td>The space temperature in the room doesn't comply with the requirement</td>
<td>The time diagram of the heating doesn't comply with the requirement</td>
<td>• Check and if necessary adjust the setting of the week day, time and date</td>
</tr>
<tr>
<td></td>
<td>The setting Space temperature doesn't comply with the requirement</td>
<td>• Check and if necessary adjust the setting of the space temperature, correct the parameter 720 Heating curve slope and Influence of space (parameter of Service settings)</td>
</tr>
<tr>
<td></td>
<td>There is no hot water heating</td>
<td>Hot water heating is switched off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The comfort required temperature is too low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Incorrect date and time setting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The hot water sensor has an insufficient contact with the heater cladding</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The three-way valve doesn't switch over</td>
</tr>
<tr>
<td>Switching-off at a failure</td>
<td>See table 6</td>
<td>• See table 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WARNING!!!**
The boiler sensors don’t fulfill a function of safety equipment. If the floor heating is used, it has to be protected by an extern thermostat. Otherwise, if the three-way valve is opened, the floor heating may be damaged.

### 9 Maintenance

Switch-off the equipment before each cleaning-up.
The surface of the product doesn't require special maintenance. The outer cover of the boiler may be wiped by a dry clout or a clot wetted in detergent solution. In no case you can clean the boiler surface by dissolution reagents or with abrasive materials.

During checking tightness of the gas distribution and connecting the valve, it is necessary to be particular about not wetting the coil of the gas valve!

> All other maintenance may be performed by only a contractual service organization trained by the manufacturer!

The user is obliged to provide regular annual check of the gas boiler. In case of violation of these conditions, no warranty repairs can be required.
The burner sealing has to be replaced with the interval of 2 years of operation or when damaging.

Use exclusively spare parts approved by the manufacturer in order to guarantee the safety a long term service life of the boiler.

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27
10 IMPORTANT WARNINGS

- Call a service organization trained by the manufacturer for the purpose of installation and adjustment.
- The boiler equipped with electric equipment supplied from electric power network has to be earthed.
- The boiler may be only used for the purposes, which it is determined for.
- The boiler may only operate persons in accordance with this manual.
- The boiler is not determined for using by persons (including children), whose physical, sensible or intellectual inability or absence of experience and knowledge prevents from safety using of the consumer, until they are under supervision or until they are instructed of using of the consumer by a person responsible for their safety.
- You should watch the children to ensure that they don't play with the consumer.
- The boiler is fully automatic, that's why we don't recommend disconnecting it from electric power.
- The boiler is equipped with automatic anti-frost protection (provided it is connected to electric energy).
- No intervention is allowed into the protected parts.
- No subjects from flammable materials may be stocked, placed or hung near the boiler and flue gas ducting (the safety distance of the consumer from flammable materials in the direction of the main radiation is 50 mm, and in other directions - 10 mm).
- The safety distance of the boiler and the flue gas ducting from flammable materials must be observed.
- If any construction works are carried out in the surrounding of the boiler, please switch off the boiler in time and protect it against pollution.
- If other works are carried out in the surrounding of the boiler, such as works with painting materials, glues, etc., please switch off the boiler in time and protect it against pollution.
- Don't clean up the boiler with flammable or explosive materials.
- In the winter period (for example, at departure to a holiday), it is necessary to ensure in the needed range a check of functionality of the boiler and the whole heating system, in order to prevent from water freezing and a consequential damage of the equipment as a result of an extern cause (for example, an outage of power, heating gas, etc.).
- Due to a possible long-term electric power outage during the heating period it is necessary to add anti-freeze fluid into the system, which is approved by the manufacturer of the anti-freeze fluid for this type of the boiler, or empty the system to prevent against freezing the heating system and the boiler.
- In case of boilers with exhausting flue gases into the surrounding through the outer wall of the building, during strong freezing temperatures it is necessary to check whether condensed water from flue gases is not frozen in the exhaust basket.
- The boiler sensors don't fulfill a function of safety equipment. If the floor heating is used, it has to be protected by an extern thermostat. Otherwise, if the three-way valve is opened, the floor heating may be damaged.
- The boiler is supplied by electric current of 230 V.
- In case of a fire, extinguish the boiler as electric equipment.
- Beware of gas escape (if you suspect that gas escapes, close the gas supply, ventilate - and call service). The gas cock under the boiler has to be always accessible.
- It is necessary to exclude pollution of combustion air by halogen hydrocarbons (they are a part, for example, of sprays, dissolution reagents, paints, glues) and dust.
- During mounting, installation and servicing the consumer it is necessary to observe norms valid in the corresponding country of installation.

In case of violation of these conditions, no warranty repairs can be required.

11 Instructions for product liquidation after the lapse of its service life

VIADRUS a.s. is a contractual partner of company EKO–KOM a.s. with the client number F00120649.
The packages comply with EN 13427.

We recommend liquidating packages by the following method:
- plastic film, cardboard cover – please use salvage points
- metal tightening tapes – please use salvage points
- wooden basement, it serves for one use, and it cannot be further used as a product. Its liquidation is a subject of the law 477/ 2001 Sb. and 185/2001 Sb., subsequently amended.

We recommend liquidating separate parts of the boiler as followed:
- the heat-exchanger (grey cast-iron) – please use salvage points,
- pipeline distributions, claddings – please use salvage points,
- other metal parts – please use salvage points,
- insulation materials – by means of a company acting in collection and liquidation of waists.
On loss of useful features of the product, you can use backward withdrawal of the product (if implemented), in case of a declaration of the producer that this is a waist; manipulation with this waist is to be according to the valid legislation of a corresponding country.

12 Warranty and responsibility for defects

VIADRUS a.s. provides a basic warranty period with the duration of 24 months from the sell-by date, but not longer than 30 months from the dispatch date from VIADRUS a.s.

The condition of the warranty validity is an observance of instructions for installation, mainly:
- Connection according to the manufacturer's schemes by a qualified supplying or mounting company with a valid mounting certificate.
- Commissioning the product by a service company with a valid service certificate.
- Observance of instructions specified in the Service and installation manual for the boiler.
- Performance of regular revisions, specified by the manufacturer, by a service company with a valid service certificate.
- Using the original spare parts supplied by the manufacturer.
- Sending information to the manufacturer about commissioning the boiler (it has to be sent by the end customer – the user). Mainly it is necessary to specify when and who commissioned the boiler, and specify the precise address of operation of the boiler.

VIADRUS a.s. provides an extended warranty period to the boiler drum for the time period of 60 from the sell-by date, but not longer than 66 months from the dispatch date from VIADRUS a.s.

The condition of acceptance of the extended warranty period is:
- Fulfillment of conditions for acceptance of the basic warranty period.
- Sending information to the manufacturer about commissioning the boiler (it has to be sent by a service company).
- Performance of regular service revisions within the range specified by the manufacturer, by a service company with a valid service certificate.

In case of reclaiming the cladding, the customer is obliged to present the packing label of the boiler cladding, which is placed on the cardboard box, in which the cladding is dispatched.

The user is obliged to entrust the removal of failures only to a qualified contractual service accredited by the manufacturer of the boiler VIADRUS a.s., otherwise the warranty for the proper function of the boiler is not valid. After filling-up, the "Certificate of boiler quality and completeness" serves as the "Warranty certificate".

The user is obliged to perform regular maintenance of the boiler.

Each announcement of defects has to be performed immediately after their location, and always in a written form together with phone discussion.

In case of non-observance of the above mentioned instructions, the manufacturer's warranties would not be accepted.

The manufacturer reserves the right for changes carried out within innovation of the product, which don't need to be contained in this manual.

The manufacturer does not hold responsible for possible losses, unless the product is not used in accordance with the conditions specified in this instructions manual.

The warranty doesn’t relate to:
- defects caused by a wrong mounting and incorrect operation of the product and defects caused by incorrect maintenance – see chapter 9;
- damage and losses occurred as a result of non-observance of water quality in the heating system - see chapter 7.1, or due to using anti-freeze liquids;
- damage of the product during transportation or other mechanical damage;
- defects caused by insufficient storage;
- defects occurred due to nonobservance of instructions specified in this manual;
- defects caused by a natural disaster or a force majeure event.
The annex for the warranty certificate for the customer - the user

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<th>Record date</th>
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<th>Customer signature</th>
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